

Connectathon 2024 Terminology Subtrack Webinar 2

Kai Kewley

Alejandro Lopez Osornio

SNOMED International

Last Updated:

August 12th, 2024

Agenda

1

FHIR Terminology Module

2

Local terminologies

3

Terminology API

4

Use cases

5

Next steps

HL7 FHIR

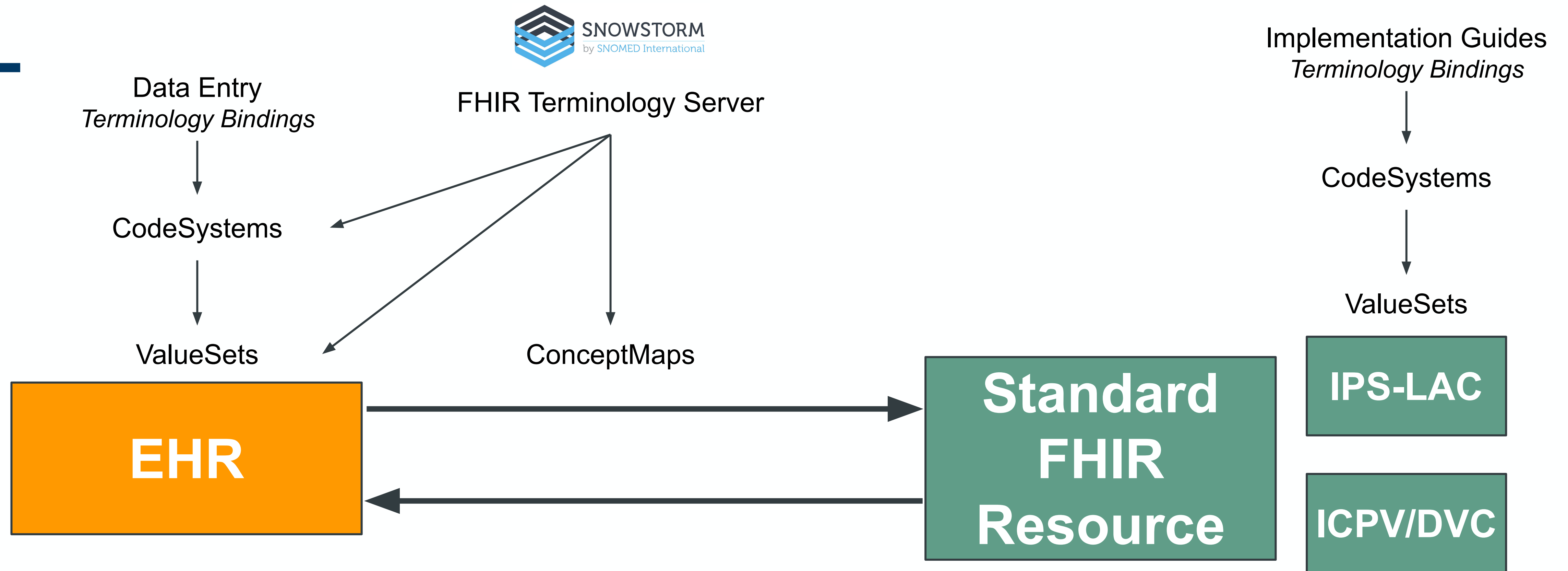
Terminology Module



The main Terminology **Resources** are:

- **CodeSystem**
 - examples: “SNOMED CT International Edition - Sept 2023”, “LOINC v2.75” or “ICD-10 Version:2019”
- **ValueSet**
 - examples: “Nursing Activities Subset” or “Clinical Procedures”
- **ConceptMap**
 - e.g. “SNOMED CT to ICD-10 Map” or “SNOMED CT to MedDRA Map”

Terminology Subtrack



Connectathon Value Sets

- Agreed terminology subsets that we will use to demonstrate data exchange
- The sets will be mapped to preferred binding code systems
- Participants that don't use these code systems will map to these codes

	Antecedentes
1	Diabetes Mellitus insulino requiriente
2	Daiabetes Mellitus no insulino requiriente
3	Hipertensión arterial esencial
4	Dislipemia
5	Hiperuricemia
6	Infarto de Miocardio
7	Enfermedad pulmonar obstructiva crónica
8	Lupus eritematoso Sistémico
9	Accidente cerebro vascular
10	Migraña
11	Epilepsia
12	Hipotiroidismo
13	Dermatitis atópica
14	Tabaquismo
15	Sedentarismo
16	Enfermedad renal crónica
17	Tuberculosis
18	Hipoacusia
19	Apnea obstructiva del sueño
20	Trombosis venosa profunda

	Diagnósticos
1	Hipertensión arterial primaria
2	Neumonía bacteriana
3	Asma
4	Artritis reumatoridea
5	Anemia ferropénica
6	Convulsión
7	Trastorno depresivo
8	Cáncer de mama
9	Enfermedad de Párkinson
10	Desnutrición
11	Enfermedad de Crohn
12	Esquizofrenia paranoide
13	Trastorno de ansiedad generalizada
14	Gota
15	Hipotiroidismo congénito
16	Deshidratación aguda
17	Neumotórax espontáneo
18	Úlcera péptica
19	Endocarditis infecciosa
20	Leucemia linfoblástica aguda

	Vacunas
1	Vacuna contra SARS - CoV-2
2	Vacuna antituberculosa (BCG)
3	Vacuna contra tétanos, difteria y tos ferina
4	Vacuna contra fiebre amarilla
5	Vacuna contra Hepatitis B
6	Vacuna contra sarampión, paperas y rubéola
7	Vacuna contra el virus del papiloma humano
8	Vacuna antipoliomelítica oral (VOP)
9	Vacuna contra influenza
10	Vacuna antirrábica
11	Vacuna antineumocócica
12	Vacuna antipoliomelítica inactivada (VIP)
13	Vacuna antimeningocócica
14	Vacuna contra hepatitis A
15	Vacuna contra la fiebre tifoidea
16	Vacuna contra la varicela
17	
18	
19	
20	

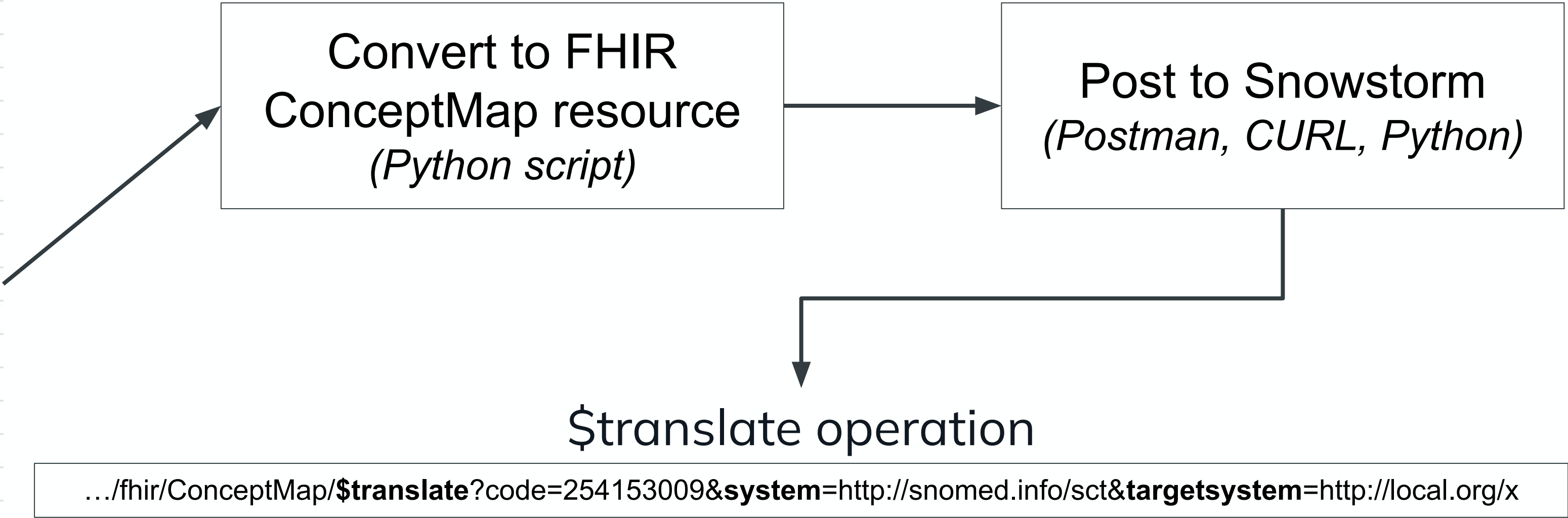
	Alergias
1	Alergia a alimentos
2	Alergia a amoxicilina
3	Alergia a analgesicos no esteroideos
4	Alergia al ibuprofeno
5	Alergia al látex
6	Alergia a picadura de insectos
7	Alergia al ácido acetilsalicílico
8	Alergia a cefalosporinas
9	Alergia a sulfonamidas
10	Alergia a quinolonas
11	Alergia a allopurinol
12	Alergia a gentamicina
13	Alergia a medios de contraste
14	Alergia a lidocaína
15	Alergia a corticosteroides
16	Alergia a proteína de leche de vaca
17	Alergia al Huevo
18	Alergia a betabloqueantes
19	Alergia al gluten
20	Alergia a propofol

	Medicación
1	Metformina
2	Enalapril
3	Levotiroxina
4	Atorvastatina
5	Insulina glargina
6	Salbutamol
7	Omperazol
8	Warfarina
9	Prednisona
10	Pregabalina
11	Morfina
12	Salbutamol
13	Loratadina
14	Atenolol
15	Carbamazepina
16	Ranitidina
17	Allopurinol
18	Losartán
19	Rivastigmina
20	Acido acetilsalicílico

Connectathon Value Sets

- Maps will be uploaded to Snowstorm as FHIR ConceptMaps to enable \$translate

	Diagnósticos	Local Code
1	Hipertensión arterial primaria	242
2	Neumonía bacteriana	32234
3	Asma	675678
4	Artritis reumatoridea	3342
5	Anemia ferropénica	8899
6	Convulsión	121
7	Trastorno depresivo	333
8	Cáncer de mama	667
9	Enfermedad de Párkinson	135
10	Desnutrición	987
11	Enfermedad de Crohn	234
12	Esquizofrenia paranoide	567
13	Trastorno de ansiedad generalizada	342
14	Gota	8787
15	Hipotiroidismo congénito	645645
16	Deshidratación aguda	3453
17	Neumotórax espontáneo	89687
18	Úlcera péptica	269
19	Endocarditis infecciosa	443
20	Leucemia linfoblástica aguda	4534



Creating local codes



Reference concepts

Local Codes (edit)

Standard Codes (provided)

Local CodeSystem
URI
(edit)

Subsets Conectaton - Test Data 1 .XLSX

File Edit View Insert Format Data Tools Help

100% 123 Calibri 11

F4 M45

Code	Antecedentes	Local Code	Local Term	ICD-10 Code	IC D-10 Term	SNOMED Code	SNOMED Term
H1	Diabetes Mellitus insulino requiriente	L1	Diabetes Mellitus insulino	M45	Diabetes Mellitus ins	46635009	Diabetes mellitus type 1 (disorder)
H2	Daiabetes Mellitus no insulino requiriente	L2	Daiabetes Mellitus no in	M46	Daiabetes Mellitus no	44054006	Diabetes mellitus type 2 (disorder)
H3	Hipertensión arterial esencial	L3	Hipertensión arterial es	M47	Hipertensión arterial	59621000	Essential hypertension (disorder)
H4	Dislipemia	L4	Dislipemia	M48	Dislipemia	370992007	Dyslipidemia (disorder)
H5	Hiperuricemia	L5	Hiperuricemia	M49	Hiperuricemia	35885006	Hyperuricemia (disorder)
H6	Infarto de Miocardio	L6	Infarto de Miocardio	M50	Infarto de Miocardio	22298006	Myocardial infarction (disorder)
H7	Enfermedad pulmonar obstructiva crónica	L7	Enfermedad pulmonar d	M51	Enfermedad pulmona	13645005	Chronic obstructive pulmonary disease (disorder)
H8	Lupus eritematoso Sistémico	L8	Lupus eritematoso Sisté	M52	Lupus eritematoso Si	55464009	Systemic lupus erythematosus (disorder)
H9	Accidente cerebro vascular	L9	Accidente cerebro vascu	M53	Accidente cerebro va	230690007	Cerebrovascular accident (disorder)
H10	Migraña	L10	Migraña	M54	Migraña	37796009	Migraine (disorder)
H11	Epilepsia	L11	Epilepsia	M55	Epilepsia	84757009	Epilepsy (disorder)
H12	Hipotiroidismo	L12	Hipotiroidismo	M56	Hipotiroidismo	40930008	Hypothyroidism (disorder)
H13	Dermatitis atópica	L13	Dermatitis atópica	M57	Dermatitis atópica	24079001	Atopic dermatitis (disorder)
H14	Tabaquismo	L14	Tabaquismo	M58	Tabaquismo	77176002	Smoker (finding)
H15	Sedentarismo	L15	Sedentarismo	M59	Sedentarismo	415510005	Sedentary lifestyle (finding)
H16	Enfermedad renal crónica	L16	Enfermedad renal cróni	M60	Enfermedad renal crd	709044004	Chronic kidney disease (disorder)
H17	Tuberculosis	L17	Tuberculosis	M61	Tuberculosis	56717001	Tuberculosis (disorder)
H18	Hipoacusia	L18	Hipoacusia	M62	Hipoacusia	15188001	Hearing loss (disorder)
H19	Apnea obstructiva del sueño	L19	Apnea obstructiva del su	M63	Apnea obstructiva de	78275009	Obstructive sleep apnea syndrome (disorder)
H20	Trombosis venosa profunda	L20	Trombosis venosa profu	M64	Trombosis venosa pro	128053003	Deep venous thrombosis (disorder)

Antecedentes Personales Diagnósticos Vacunas Alergias Medicación Procedimientos

The six Sections of the IPS Composition

[Open Spreadsheet →](#)



Connectathon Value Sets

39 FHIR Resources



- **4 CodeSystems** (*SNOMED CT is preloaded*)
 - ICD-10*, ICD-11*, Local CodeSystem, RACSEL Reference (* fragments)
- **23 ValueSets**
 - Full lists + domain lists
- **12 ConceptMaps** (*SNOMED → ICD-10 full map is preloaded*)
 - 4 to local, 4 from local, 4 SCT - ICD bidirectional



National Node

- <http://localhost/browser>
- <http://localhost/fhir>
- <http://localhost/connectathon-swagger>

Loading in the Terminology Server

```
> python3 racsel-convert-xlsx-to-fhir.py Subsets_Conectathon_Test_Data_defects.xlsx
```

Source file: Subsets_Conectathon_Test_Data_defects.xlsx

FHIR package saved to racsel_fhir_package.tgz

Load in Snowstorm with curl --form file=@racsel_fhir_package.tgz --form resourceUrls="" <http://localhost:8080/fhir-admin/load-package>

```
> curl --form file=@racsel_fhir_package.tgz --form resourceUrls="" http://localhost:8080/fhir-admin/load-package
```

Snowstorm logs:

```
2024-08-05 14:20:40 2024-08-05T17:20:40.934Z INFO 1 --- [nio-8080-exec-1] o.s.s.f.services.FHIRLoadPackageService : Importing 39 resources, found within index of package racsel_fhir_package.tgz.
```

....

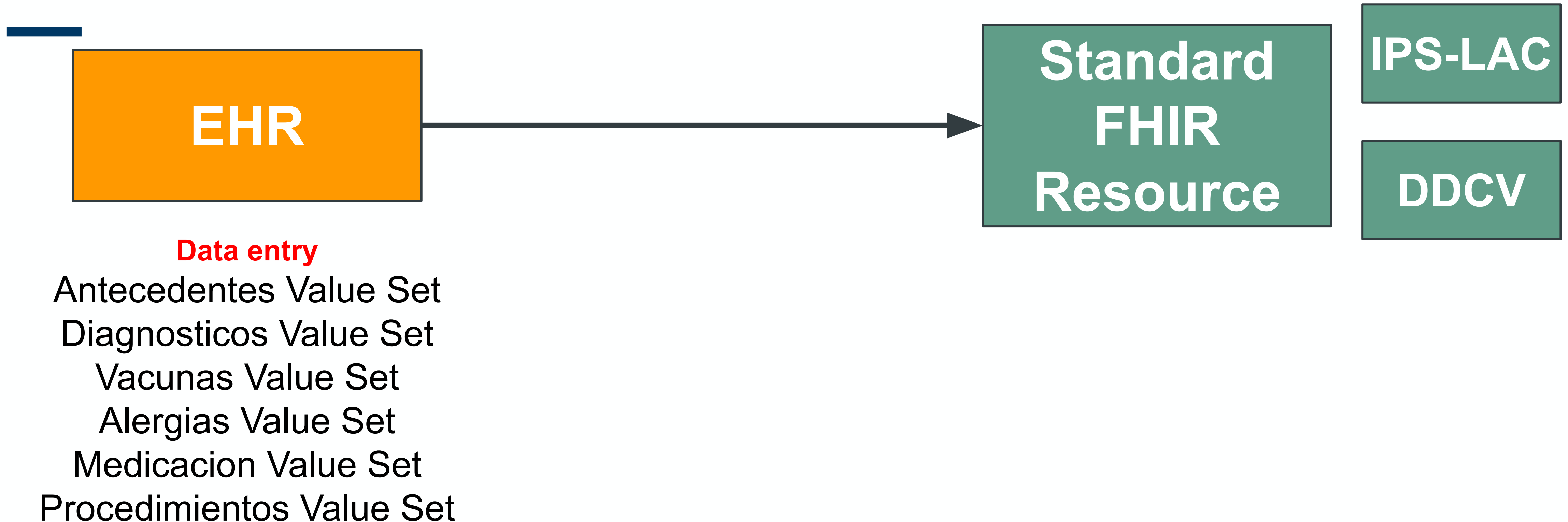
```
2024-08-05 14:20:43 2024-08-05T17:20:43.617Z INFO 1 --- [nio-8080-exec-1] o.s.s.f.services.FHIRLoadPackageService : Completed import of package racsel_fhir_package.tgz.
```


Using the terminology

The screenshot shows the Swagger UI for the FHIR Resources API. At the top, the Swagger logo is on the left, a search bar with "/api-docs" is in the center, and an "Explore" button is on the right. Below this, the title "FHIR Resources API" is displayed with version "1.0.0" and "OAS3" tags. A link to "/api-docs" and a description "API for FHIR CodeSystem, ValueSet, and ConceptMap" are provided. A "Servers" section shows a dropdown menu with "http://localhost:8080/fhir" selected. The main content area, titled "default", lists seven API endpoints, each with a "GET" method button, a path, and a description:

- GET** **/CodeSystem** Get a list of CodeSystems
- GET** **/ValueSet** Get a list of ValueSets
- GET** **/ConceptMap** Get a list of ConceptMaps
- GET** **/ValueSet/\$expand** Expand a ValueSet
- GET** **/ConceptMap/\$translate** Translate a concept using a ConceptMap
- GET** **/CodeSystem/\$lookup** Lookup a code in a CodeSystem
- GET** **/ValueSet/\$validate-code** Validate a code against a ValueSet

Collecting data for IPS or DDCV



Creating IPS or DDCV



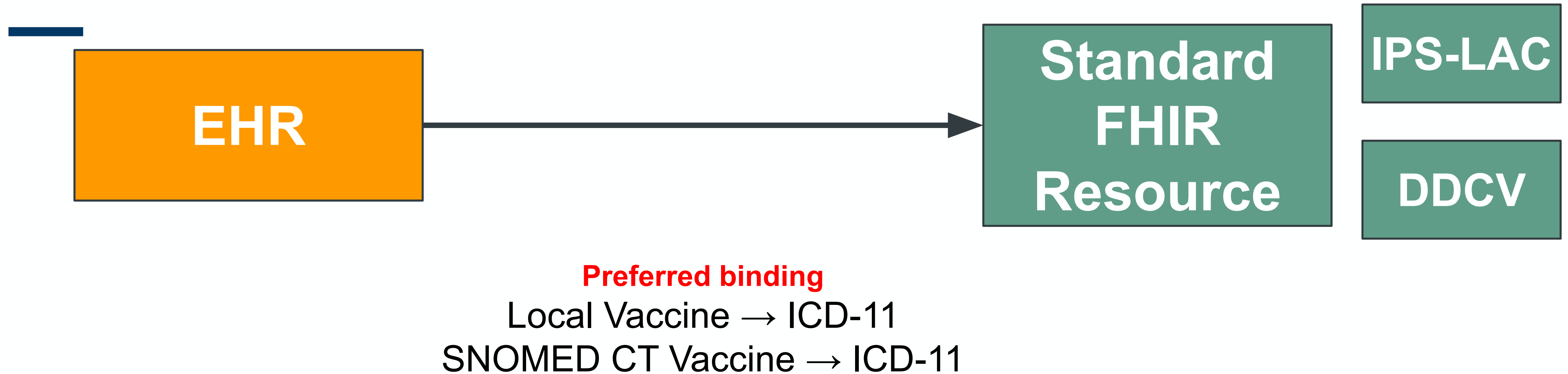
Preferred binding

Local Diagnosis → ICD-10
 SNOMED CT Diagnosis → ICD-10

Additional binding

Local Diagnosis → SNOMED CT
 ICD-10 Diagnosis → SNOMED CT

Creating IPS or DDCV



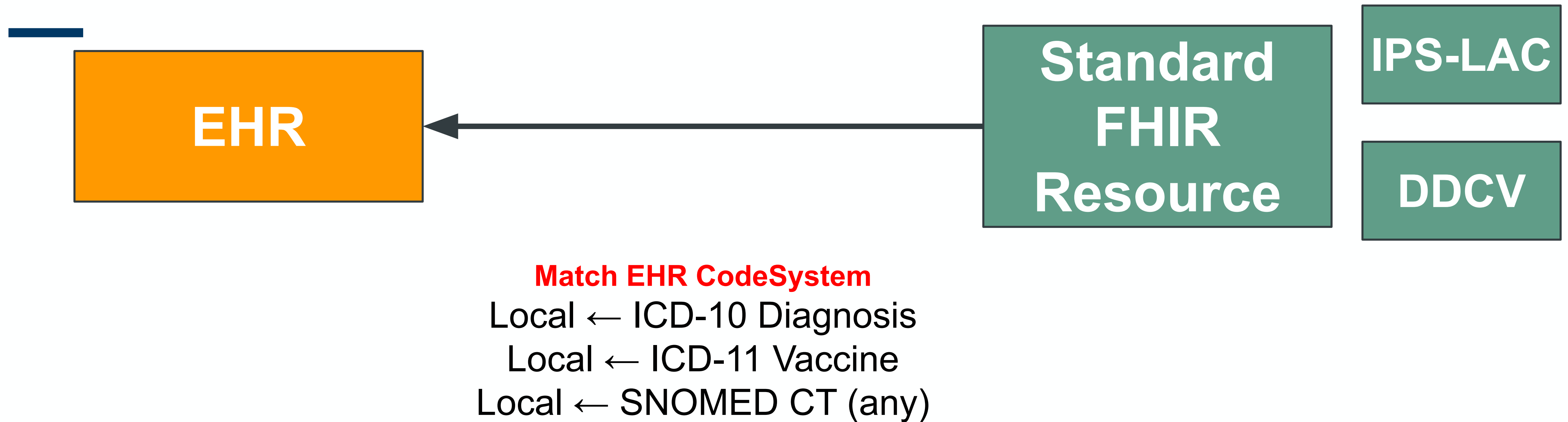
Creating IPS or DDCV



Preferred binding

Local Medication → SNOMED CT
Local Procedure → SNOMED CT

Importing an IPS or DDCV



Next steps

- Edit you local code mappings
- Convert to FHIR package
- Import in your Snowstorm
- Test!
- Workshop #3
 - August 23rd, 2024, 12hs EST
 - Troubleshooting
 - Final tests
- Please reach out in Slack!



snomed.org



x.com/SnomedCT



linkedin.com/company/ihtsdo



youtube.com/@snomedct

SNOMED
International

Thank You

implementation@snomed.org