

Generating a FHIR ConceptMap from WHO's ICD-10 to ICD-11 Mapping Tables

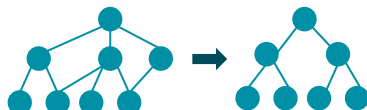
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1 Motivation – ICD-10 vs. ICD-11

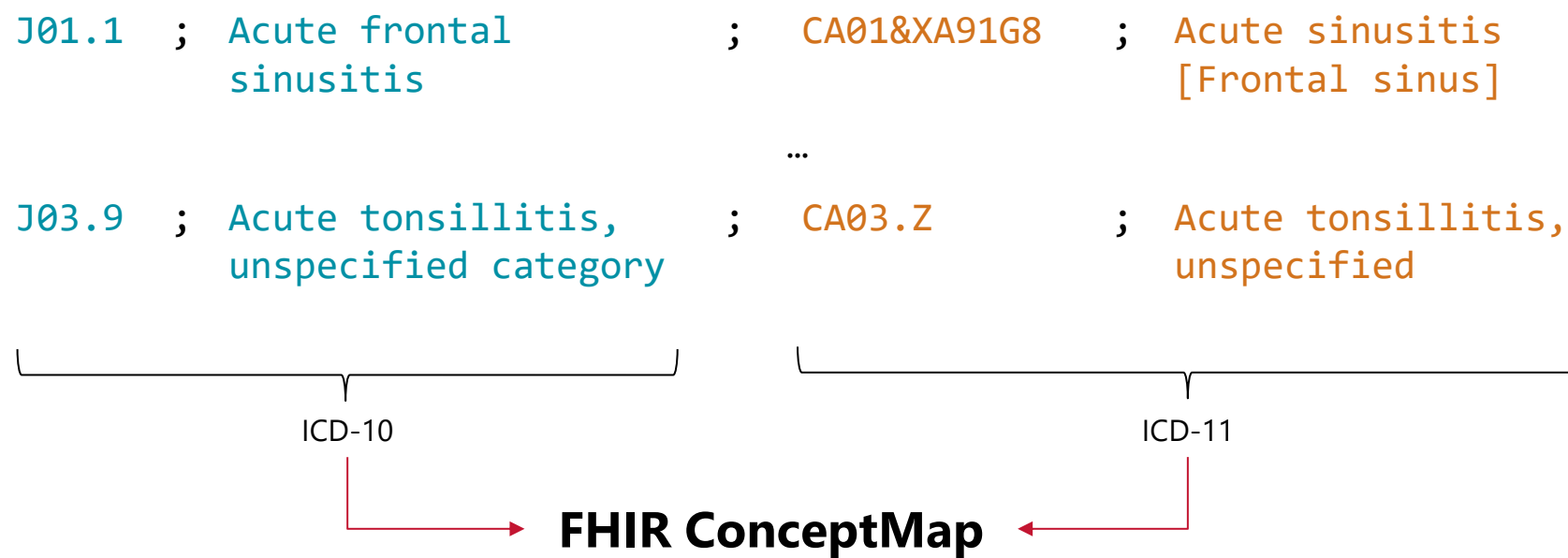
- ICD:** International Statistical Classification of Diseases and Related Health Problems

	ICD-10	ICD-11
Background	1994 - Monohierarchical 	2022, full implementation for mortality (MMS) in 2027 - Polyhierarchical, converted to monohierarchical through linearization 
Examples	J03.9 (Acute tonsillitis, unspecified) Residual class: "Y" and "Z" in ICD-11 instead of "8" and "9" J01.1 (Acute frontal sinusitis)	CA03.Z (Acute tonsillitis, unspecified) CA01 & XA91G8 (Acute sinusitis [Frontal sinus]) Extension codes (postcoordination) for ICD-11

Mapping

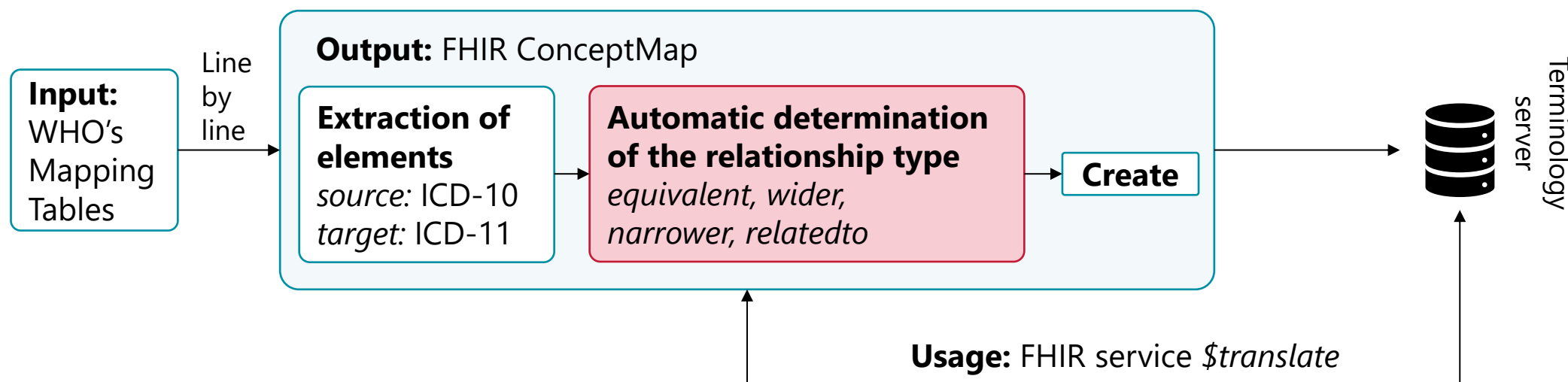
1 Motivation – WHO's Mapping Tables¹

- **Unidirectional** mapping from ICD-10 to ICD-11
- **Text file:**



¹ <https://icd.who.int/browse/2025-01/mms/en>

2 Methods – Pipeline



- Two main tasks
 - Creation of the FHIR ConceptMap
 - Request the mapping

2 Methods – Creation of the FHIR ConceptMap (R4)

- Represent direction dependent relationships between codes: **ICD-10** → **ICD-11**
- Algorithm for determining **relationship types**

FHIR R4	Example (ICD-10 → ICD-11)
Equivalent	J03.9 (Acute tonsillitis, unspecified) → CA03.Z (Acute tonsillitis, unspecified)
Wider	J01.4 (Acute pansinusitis) → CA01 (Acute sinusitis) C34 (Malignant neoplasm of bronchus and lung) C34.0 (Malignant neoplasm: Main bronchus) ... C34.9 (Malignant neoplasm: Bronchus or lung, unspecified) → 2C25.Z (Malignant neoplasms of bronchus or lung, unspecified)
Narrower	---
Relatedto	J12.0 (Adenoviral pneumonia) → CA40.10 (Pneumonia due to Adenovirus)

2 Methods – Request the mapping (R4)

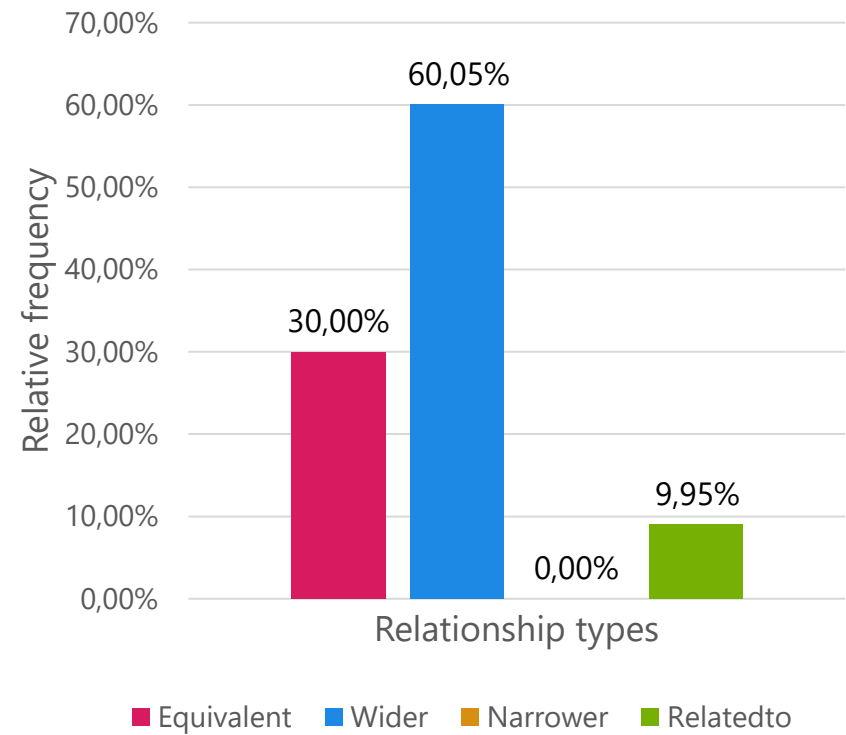
- Terminology service *\$translate*
- Example: J03.9 (Acute tonsillitis, unspecified)

```
{{url_server}}/ConceptMap/$translate/?  
url=https://imi.uni-luebeck.de/fhir/ConceptMap/  
mapping-icd10-to-icd11&  
source=http://who.int/fhir/CodeSystem/icd-11-who&  
system=http://who.int/fhir/CodeSystem/icd-10-who&  
code=J03.9
```

```
{ "resourceType": "Parameters",  
  "parameter": [  
    { "name": "result", "valueBoolean": true },  
    { "name": "match",  
      "part": [  
        { "name": "equivalence", "valueCode": "equivalent" },  
        { "name": "concept",  
          "valueCoding": {  
            "system": "http://who.int/fhir/CodeSystem/icd-11-who",  
            "code": "CA03.Z" }  
        }  
      ],  
      ...  
    }  
  ]  
}
```

3 Results

- **12,592** mapping entries



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Relatedto	J12.0 (Adenoviral pneumonia) → CA40.10 (Pneumonia due to Adenovirus)

4 Conclusion

- WHO's Mapping Table successfully converted into FHIR ConceptMap
 - Version: R4 and R5
- Expert validation remains essential
 - Particularly for ambiguous mappings (e.g., *relatedTo*)
 - Initial checks show high accuracy for *equivalent* and *wider* mappings

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² <https://mii-termserv.de/en/>

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