Mapping of Critical Care EHR Flowsheet data to OMOP CDM via SSSOM

A Simple Standard for Sharing Ontology Mappings

Presenter: Polina Talapova, MD, PhD
Prologue
Various Types of Critical / Intensive Care EHR Flowsheets

- Vital Signs
- Neurological Assessment
- Respiratory Assessment
- Cardiac Assessment
- Renal Assessment
- Intake and Output
- Gastrointestinal Assessment
- Nutritional Assessment
- Wound Care
- Pain Assessment
- Nursing

Semantic Domains
- Measurements
- Observations
- Procedures
- Conditions
- Drugs
- Devices
Health Data Mappings:
- Costly & use-case specific
- Essential for algorithm development and analytics
- Requires training & healthcare expertise

Open-Source Mappings:
- Lacking documentation & metadata
- Can lead to data inconsistencies

Adoption Challenges:
- Complicated by varied data sharing approaches
The OMOP Vocabularies, akin to a living organism, thrive with diligent care and stands to benefit from enhancements in areas such as:

- maintenance
- provenance
- precision
- mapping justification
Solution [1]: Generate SSSOM Metadata

Mapping Origin and Intent Metadata
- mapping_source: Tufts-CTSI:CCFS
- mapping_set_id: 4010000001
- mapping_set_label: Critical Care Flowsets
- mapping_to: OMOP

Mapping Creation and Maintenance Metadata
- mapping_provider: Tufts CTSI
- author: John Doe
- ORCID
- reviewer: Jane Doe
- ORCID
- mapping_tool: OHDSI Usagi
- mapping_date: 2023-01-15
- mapping_tool_version: v.1.4.3

Mapping Detailed Metadata
- confidence: 1
- mapping_cardinality: 1:1
- mapping_justification: semapv:LexicalMatching

Subject Metadata
- subject_id: CCFS:700000046
- predicate_id: skos:exactMatch
- object_id: OMOP:21490695

Object Metadata
- object_label: Cerebral perfusion pressure
- object_category: Measurement
- object_source_version: LOINC 2.73

Subject Metadata
- subject_label: CPP (mmHg)
- subject_category: PICU Vital Signs
- subject_type: Flowsheet Item
- subject_source_version: v.1.0
Solution \([2]\): Use **MAPPING_METADATA** table

<table>
<thead>
<tr>
<th>CDM Field</th>
<th>Datatype</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>mapping_concept_id</td>
<td>integer</td>
<td>Yes</td>
</tr>
<tr>
<td>confidence</td>
<td>float</td>
<td>Yes</td>
</tr>
<tr>
<td>predicate_id</td>
<td>varchar</td>
<td>Yes</td>
</tr>
<tr>
<td>mapping_justification</td>
<td>varchar</td>
<td>Yes</td>
</tr>
<tr>
<td>mapping_provider</td>
<td>varchar</td>
<td>Yes</td>
</tr>
<tr>
<td>author_id</td>
<td>int</td>
<td>Yes</td>
</tr>
<tr>
<td>author_label</td>
<td>int</td>
<td>Yes</td>
</tr>
<tr>
<td>reviewer_id</td>
<td>int</td>
<td>Yes</td>
</tr>
<tr>
<td>reviewer_label</td>
<td>int</td>
<td>Yes</td>
</tr>
<tr>
<td>mapping_tool</td>
<td>varchar</td>
<td>No</td>
</tr>
<tr>
<td>mapping_tool_version</td>
<td>varchar</td>
<td>No</td>
</tr>
<tr>
<td>subject_category</td>
<td>varchar</td>
<td>No</td>
</tr>
<tr>
<td>subject_type</td>
<td>varchar</td>
<td>No</td>
</tr>
</tbody>
</table>
Solution: Automation

- SSSOM MAPPING TABLE
- MAPPING_METADATA TABLE
- STAGING TABLES
- BASIC VOCABULARY TABLES
- EVENT TABLES
Needs [1]: Integration with OHDSI tools
Needs [2]: Community Contribution
Visit our poster #501!