

# Development of a federated approach in the OMOP CDM for RWE generation by standardization of computable operational definitions

## Title

Leveraging OMOP Common Data Model for Harmonized Data Extraction and Federated Network Creation to build an Immunocompromised Research Network

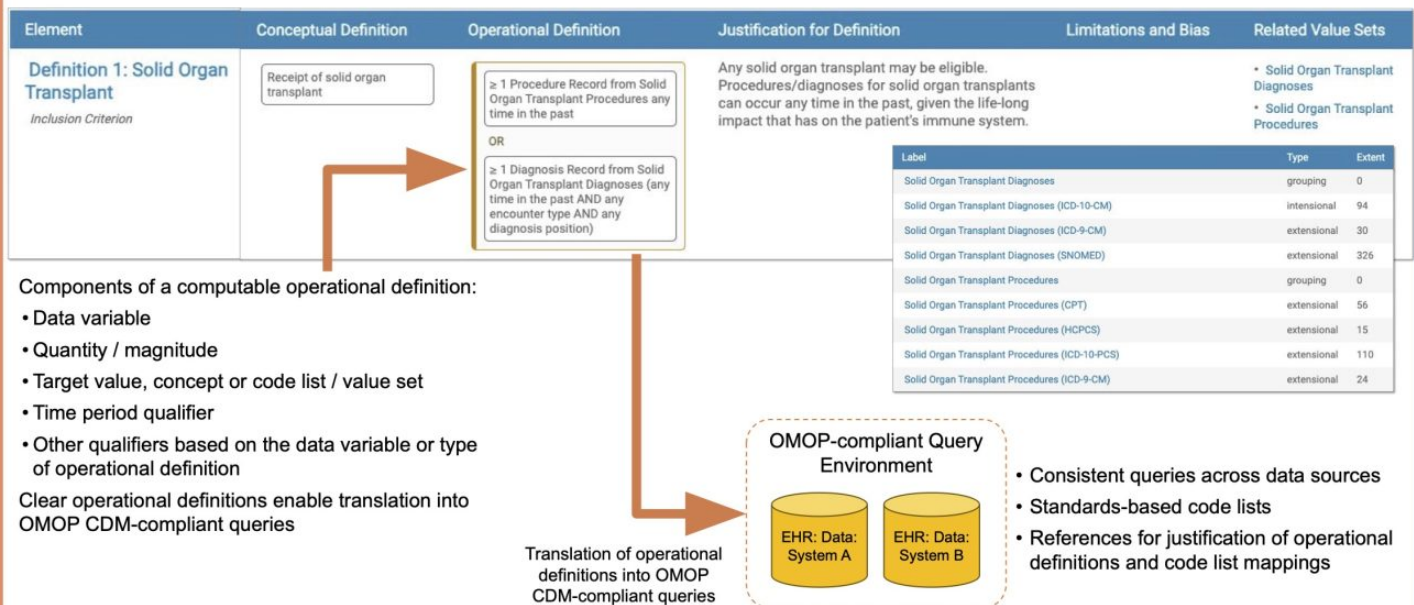
**Background:** Graticule is leveraging the OMOP Common Data Model (CDM) to support harmonized data extraction and consistent analyses in multiple regions as part of an effort to build a research network to execute various real world evidence studies on immunocompromised patients globally. A single, foundational CDM is particularly beneficial for this effort as the creation of federated network, leaving data in situ, is being explored. This approach depends on the ability to translate computable standards-based operational definitions fluidly across data partners. Our methods and preliminary results are presented.

## Methods

Clear conceptual definitions and computable operational definitions were developed for each study element. Computable operational definitions included algorithms and value sets that were most often identified via literature review or through publicly available repositories (e.g., CMS, VSAC), minimizing the need for de novo creation.

- 1 Original public resources for each operational definition were reviewed to identify existing vocabulary mappings (e.g., where both ICD-9-CM and ICD-10-CM codes were indicated). These mappings were accepted & referenced.
- 2 Where the original reference did not indicate mappings, other publicly available resources were reviewed for relevant concept mappings analogous to the original intent.
- 3 Where no pre-existing mappings were identified, automated cross-walking methods were used (e.g., CMS general equivalence mappings). Otherwise manually curated mappings were used, as necessary.

These computable operational definitions were deployed in the OMOP-compliant N3C (National COVID Cohort Collaborative) dataset in the US. Definitions were then adapted to account for differences in approved indications in European countries. Standardized definitions using common vocabularies in the US, such as ICD-10-CM, SNOMED, RxNorm, HCPCS, and LOINC vocabularies from the condition occurrence, drug exposure, procedure, and measurement domains were translated into standard vocabularies used in the EU such as ICD-9-CM and ATC using the following decision hierarchy:



## Results & Conclusions

**Result:** 64 core computable operational definitions utilizing 66 distinct value set groupings were reviewed. Value set groupings each represent a particular clinical concept. These 66 value set groupings collectively contain 181 distinct value sets across 12 standard vocabularies: ICD-10-CM, ICD-9-CM, SNOMED, ICD-10-PCS, ICD-9-Proc, CPT, HCPCS, CVX, LOINC, RxNorm, NDC, and ATC.

The mapped computable operational definitions were then used to collect descriptive feasibility metrics in an OMOP-compliant environment with consistent results across initial sites.

**Conclusion:** Computable operational definitions can be standardized while retaining original concept meaning. Such definitions, deployed in OMOP CDM environments, can support a federated approach that can provide insight and can contribute to robust real-world evidence generation in the United States and Europe.

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**Limitation:** Work is ongoing. Final results may differ from preliminary exploration

Yuval Koren<sup>1</sup>, Dan Housman<sup>1</sup>, Daniel Poscover<sup>1</sup>, Charles E. Barr<sup>1</sup>, Amanda Shields<sup>2</sup>, Aaron Kamauu<sup>2</sup>

<sup>1</sup> Graticule, Inc, Newton, MA, USA, <sup>2</sup> Navidence LLC, Aurora, CO, USA

