Want to Identify Cohorts Seamlessly Across Data Models? Try ACT

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Description

Clinical Data Research Networks are enabling the large-scale reuse of electronic health record (EHR) data for research. Harmonization of data in these networks is achieved by transforming raw EHR data into a standardized format that is specified by a Common Data Model (CDM). Three CDMs are in common use that include the i2b2/SHRINE-based Accrual to Clinical Trials (ACT) CDM, the Observational Medical Outcomes Partnership (OMOP) CDM, and the National Patient-Centered Clinical Research Network (PCORnet) CDM. While there are many similarities across the three CDMs, the differences among them make it non-trivial to seamlessly query across the three data models.

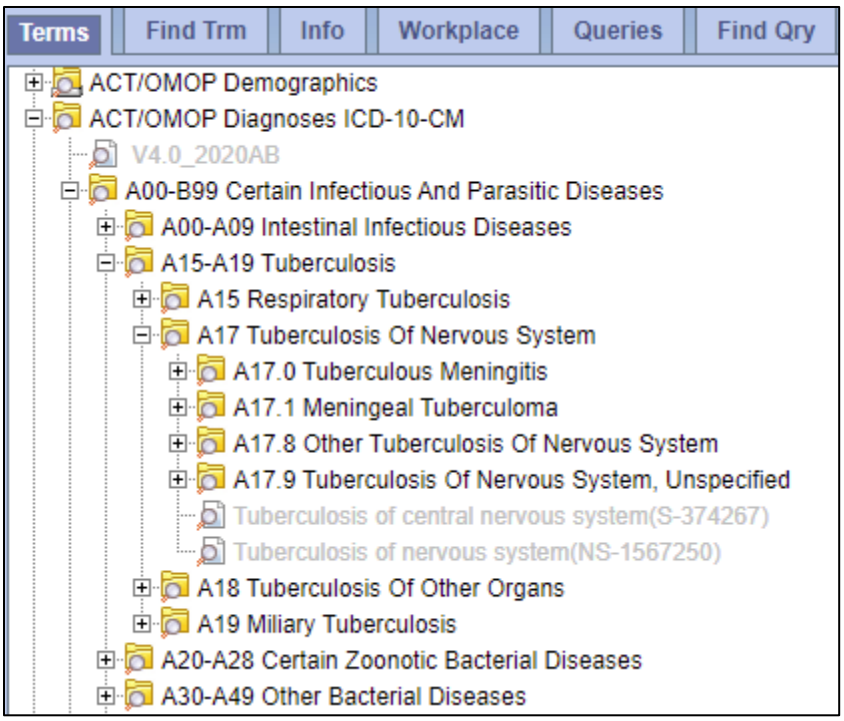

Figure. Screenshot of ACT ICD-10-CM ontology modified to enable querying of OMOP concepts (shown in gray font).

We developed a solution to seamlessly query across CDMs for the ontology-based ACT network. The NCATS-funded ACT network is a federated network of Informatics for Integrating Biology at the Bedside (i2b2) EHR data repositories across 57 Clinical and Translational Science Award (CTSA) hubs with >150 million lives. The EHR repositories are integrated by the Shared Health Research Information Network (SHRINE) platform facilitates the querying of EHRs in real time across the network. The querying is facilitated by a set of ACT ontologies that consists of medical terms arranged in a hierarchy for easy navigation; the ontologies enable the harmonization of data across the network. We adapted the ACT ontologies that were originally developed for the ACT CDM so that they can seamlessly query the OMOP and PCORnet CDMs (see Figure). This interoperability functionality will enable the ACT network to operate across the three CDMs and allow sites to maintain single the CDM of their choice.

Outline

1. Introduction to Clinical Data Research Networks and Common Data Models
2. Brief descriptions of the three major CDMs: ACT, OMOP and PCORnet CDMs
3. Similarities and differences across the three CDMs
4. A solution to seamlessly query across CDMs using ontology-based ACT network
5. Description of the ACT network and the ACT ontologies
6. Adaptation of the ACT ontologies to enable seamless querying of OMOP and PCORnet CDMs
7. Benefits of a common set of ontologies that can interoperate across CDMs

Reference

Visweswaran S, Becich MJ, D'Itri VS, et. al. Accrual to Clinical Trials (ACT): A Clinical and Translational Science Award Consortium network. JAMIA Open. 2018 Oct;1(2):147-152.