OHDSI Software Demonstrations

12:15-2:45pm

Cohort Definitions Using ATLAS

ATLAS is a web-based integrated platform for database exploration, standardized vocabulary browsing, cohort definition, and population-level analysis. ATLAS is a recently developed tool in the OHDSI technology stack that incorporates features for vocabulary exploration, cohort definition, inclusion rule impact assessment, cohort characterization and datasource characterization. The purpose of this demonstration is to demonstrate the cohort definition process, starting with vocabulary exploration to identify concepts, concept set construction for use in cohort criteria, and review of inclusion rule impact analysis.
Presenter: Chris Knoll, Janssen Research & Development

Advanced Temporal Language Aided Search for the OHDSI community

In this demonstration we introduce a search engine based on Advanced Temporal Language Aided Search to supplement the OHDSI phenotyping efforts for rule-based definitions. This search engine consists of a patient centric data model, an in-memory database, and a structured language that supports temporal operations for near-real time phenotyping.
Presenter: Juan Banda and Nigam Shah, Stanford University.

Comparative Cohort Analysis Demonstration

ATLAS, a web based interface developed as part of the OHDSI initiative, now provides a user-friendly interface that enables comparative cohort analyses. We will demonstrate how this new interface can perform a comparative cohort analysis along with various diagnostic reports and visualization tools to review the results. This workflow builds off existing capabilities in ATLAS, including vocabulary exploration, concept set generation, cohort definition, and cohort characterization.
Presenter: Frank DeFalco, Janssen Research & Development

Automated selection of Negative Control Exposure-Outcome pairs for use in Observational Studies: A capabilities demonstration

Negative control exposure-outcome pairs should be more commonly employed in observational studies to reduce the potential for systematic error. The process for identifying negative controls (either exposure controls or outcome controls) for use in observational studies requires time-consuming, manual curation of information from various knowledge sources. Here we will demonstrate a means for automating the selection of candidate negative controls by leveraging ATLAS with the standardized evidence base known as LAERTES (Large-

scale Adverse Effects Related to Treatment Evidence Standardization). Both the toolset and evidence base are open-sourced and available through OHDSI.
Presenter: Anthony Sena, Janssen Research & Development

Patient-Level Prediction Package Demo
The Patient Level Prediction R package is a novel large-scale analytics platform for developing personalised risk prediction models in observational data. The standardized framework addresses problems of the form "Amongst <target population>, which patients will develop <an outcome> during <a time-at-risk period>?" and enables predictive model fitting using an array of machine learning approaches- including regularized regression, gradient boosting machines, random forest, K-nearest neighbors, and neural networks- and applies a systematic evaluation to determine model validity based on measures of calibration, discrimination, and generalizability.
Presenter: Jenna Reps, Janssen Research & Development

Arachne: Automated Execution of distributed OHDSI Network Research
Arachne creates the secure network for OHDSI distributed research. The goal is to remove all obstacles of technical execution of studies across a network of distributed databases: each contributor to a study shall be able to focus on the scientific problem, rather than dealing with SQL queries and compatibility challenges (SQL dialects, technical infrastructure, security, etc.). Arachne features federated query execution (R and SQL) - including error handling and query refinement - and automated result aggregation and reporting, data protection and execution controls. It integrates with OHDSI tools - including SQLRender for rendering parameterized SQL and translating it to different SQL dialects, and Circe for standardized query generation.
Presenter: Yuriy Khoma, Odysseus Data Services Inc.

TxPath: An Open-Source Tool for Conducting Treatment Pathway Analyses Using the OHDSI Framework
In this demonstration we will unveil TxPath, a generalized treatment pathway analysis tool that leverages the OHDSI framework. TxPath is designed to enable data holders with data in OMOP CDM v5 format to assess patterns of usage of any set of medications or procedures across any patient cohort spanning any period of time. The inspiration for this tool was the seminal OHDSI study by Hripcsak et al that explored treatment patterns for 3 chronic diseases across 250 million patients. TxPath allows users to create a customized analysis similar to this study.
Presenter: Jon Duke, Georgia Tech

Demonstration of the OHDSI Methods Library
The OHDSI methods library is a set of open source R packages for population-level estimation implementing several observational study designs: the new-user cohort design with propensity scores, self-controlled case series, case-control, self-controlled cohort, and IC temporal pattern discovery. The packages are actively used in studies into the average effect of exposures on

outcomes within the OHDSI community. The packages interact directly with observational data in the Common Data Model, and are designed to support both large datasets and large numbers of analyses (e.g. for testing many hypotheses including control hypotheses, and testing many analyses design variations). The tools support best practices for use of observational data as learned from previous and ongoing research, such as transparency, reproducibility, as well as measuring of the operating characteristics of methods in a particular context and subsequent empirical calibration of estimates produced by the methods.
Presenters: Martijn Schuemie, Janssen Research & Development, and Marc Suchard, UCLA