OHDSI Software Demonstrations

1. **LTS Broadsea API - OHDSI methods as a service**
   This software demo will introduce the Broadsea cloud service for running OHDSI methods. The service is currently under development.
   It will show how to connect an OMOP CDM database to the Broadsea cloud service and run OHDSI methods on the data using the Broadsea Application Programming Interface (API).
   Presenter: Lee Evans, LTS Computing

2. **A Demonstration of Several Analytic Uses Cases with OHDSI Components using Google BigQuery**
   The Observational Health Data Sciences and Informatics (OHDSI) software supports multiple open source and commercial database systems. However, until recently, Google Big Query--a storage mechanism designed for large dataset analytics that is part of Google Cloud, a commercial platform as a service (PAAS) --was not one of them. In this demonstration, we step through several analytic use cases (including data characterization and summarization, cohort definition, cohort generation and population effect estimation) using core OHDSI components (Achilles, WebAPI and Atlas) that have been enhanced to interoperate with BigQuery (and other Google Cloud components). This demonstration of interoperability with BigQuery (and other Google Cloud components) not only expands the set of data storage systems supported by OHDSI software but also advances and supports efforts to adopt OHDSI standards and software by initiatives and projects that already use or intend to use BigQuery (and other Google Cloud components), such as All of Us, a high profile precision medicine initiative.
   Presenter: Taha Abdul-Basser, Columbia University

3. **Criteria2Query: Automatically Transforming Clinical Research Eligibility Criteria Text to OMOP Common Data Model (CDM)-based Cohort Queries**
   Criteriq2Query is a novel system for automatically transforming clinical research eligibility criteria text to OMOP Common Data Model-based executable cohort queries. The system Criteria2Query consists of five modules including text parsing, criteria filtering, terminology standards-based concept mapping, automatic query formulation, and query execution with dynamic feedback generation for users. Those queries generated by Criteria2Query can facilitate consistent cohort identification in multi-site clinical studies and enable end users such as clinicians and researchers to iteratively perform feasibility assessment and dynamically refine criteria based on data-driven feedback with patient counts.
   Presenter: Chi Yuan, Columbia University

4. **A Unified Chart Review Tool Integrating OMOP CDM and Unstructured Data**
   Chart review of medical records is a necessary part of clinical research. Validation of clinical outcomes, for example, often requires examination of both structured data as well as unstructured data such as clinical notes and radiology reports. We will present a user interface which allows for customized chart review and study tool that presents a unified view of the OHDSI patient data and unstructured clinical note data using Apache Solr. The application allows for chart reviewers to easily search, filter and annotate patient charts. Study managers can have additional controls, such as searching all patients, exporting results, study configuration, and limiting chart reviewer permissions to only view certain patients. The application can use OHDSI cohorts or custom cohorts with customized chart reviewer views.
   Presenter: Charity Hilton, Georgia Tech

5. **Cohort Characterization in ATLAS with Standardized Feature Generation**
   ATLAS is a web-based integrated platform for database exploration, standardized vocabulary browsing, cohort definition and population-level analysis. ATLAS recently incorporated a new enhancement to cohort generation which uses OHDSI Feature Extraction to calculate the prevalence of binary covariates within a population within different time windows. This allows a researcher to understand the characteristics of the population they have defined. The purpose of this demonstration is to demonstrate the population-level characteristics of several cohort definitions.
   Presenter: Chris Knoll, Janssen Research & Development

6. **AEGIS: Tool for semi-automatic creating medical map based on GUI (Graphic User Interface)**
   AEGIS (Application for Epidemiological Geographic Information System) is an application developed in R Shiny package which provides an interactive GUI (Graphic User Interface) that generates medical maps with epidemiological characteristics of the administrative districts. Using Global ADMinistrative areas (GADM) database which contains administrative boundary features of countries and sub national regions at multiple levels. It visualizes cohort on the map, which is generated by ATLAS. It could be an effective GIS tool to visualize clinical research for various diseases. We will demonstrate to the AEGIS tools with several cases.
   Presenter: Su Man Nam, Ajou University

7. **Integrated evidence/insight platform supported by OMOP CDM and methods library**
   ZS Evidence Portal is an enterprise, cloud-based platform build upon OMOP CDM data layer. It is designed to address common real world insight and evidence needs via standardization and modularization. The modular, standards-based approach of the platform significantly improves the speed of routine tasks and analysis such as data discovery and cohort creation while ensuring transparency.
   In this software demo session, we will walk through the platform capabilities in the following four layers:
   - Data Foundation: Ingests real-world data from a variety of sources including EMR, claims and patient registries using enterprise data lake approach.

- Core Components:
    - Common data model conversion engine leveraging pre-configured intermediate layer
    - The RWD dashboard aligns business users with the right data sources to their business and research objectives
    - The concept and cohort builder enables the creation of patient cohorts without programming interventions
    - Analytics Enablement Layer: Ready-to-use analytics is used to derive patient metrics such as patient compliance, adherence and persistency
- Consumption Components: Applications for trial optimization, observational research or interactive health economics

Presenters: Qin Ye & Abhay Jha, ZS Associates

8. **Large Scale Risk Identification System for Proactive Safety Surveillance**

   A vision for a tool for large-scale risk identification was described at the 2013 OMOP Symposium named **HOMER: H**ealth **O**utcomes and **M**edical **E**vidence **R**esearch. HOMER's objective is to take a data source converted to the OMOP common data model and produce summary statistics aligned to the Sir Austin Bradford Hill's criteria for determining association or casual relationships for all drug-outcome pairs. In this software demonstration, we aim to posit an initial framework and tooling for HOMER based on work done for proactive safety surveillance initiatives at Janssen Research & Development. This tool for evaluating and synthesizing evidence is an initial attempt to initiate further discussion around HOMER amongst the OHDSI collaborative. We will describe the process for generating evidence at scale using the OHDSI methods library for all new-drug users and hospitalization-outcome cohorts. We will then demonstrate a web interface that provides a way to explore all the generated evidence for evaluating and disseminating reports.

   Presenter: Anthony Sena, Janssen Research & Development

9. **ARACHNE – Distributed OHDSI Research Network and Study Workflow Orchestration**

   ARACHNE Research Network platform enables a consistent, transparent, secure and compliant observational research process. It brings participating organizations, e.g. data providers, investigators, sponsors and data scientists, into a single, collaborative study team and facilitates an end-to-end observational study. ARACHNE can be used internally within an organizational network and firewall boundaries (ARACHNE Workflow Suite), or across firewalls accessing databases in other organizations (ARACHNE Research Collaboration Network) deployed as a cloud based SaaS platform. The software demo will demonstrate the execution of an end to end study utilizing ARACHNE.

   Presenter: Gregory Klebanov, Odysseus Data Services