OHDSI Speed Dating

OHDSI Community Call
Jan. 17, 2022 • 11 am ET
## Upcoming OHDSI Community Calls

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Jan. 24:
Collaborations for Strategic Opportunities

Anna Ostropolets
Data Scientist, Odysseus Data Services, Inc.
PhD Graduate, Columbia University

Clair Blacketer
Director, Janssen Research and Development, Inc.

Patrick Ryan
Vice President, Observational Health Data Analytics, Janssen Research and Development, Inc.; Adjunct Assistant Professor, Columbia University
Three Stages of The Journey

Where Have We Been?
Where Are We Now?
Where Are We Going?
OHDSI Shoutouts!

Congratulations to the team of Yue Yu, Guoqian Jiang, Eric Brandt, Tom Forsyth, Sanket Dhruva, Shumin Zhang, Jiajing Chen, Peter Noseworthy, Amit Doshi, Kimberly Collison-Farr, Dure Kim, Joseph Ross, Paul Coplan, and Joseph Drozda on the publication of Integrating real-world data to assess cardiac ablation device outcomes in a multicenter study using the OMOP common data model for regulatory decisions: implementation and evaluation in JAMIA Open.
Congratulations to the team of Martijn Schuemie, Fan Bu, Akihiko Nishimura, and Marc Suchard on the publication of Adjusting for both sequential testing and systematic error in safety surveillance using observational data: Empirical calibration and MaxSPRT in Statistics in Medicine.

Adjusting for both sequential testing and systematic error in safety surveillance using observational data: Empirical calibration and MaxSPRT

Martijn J. Schuemie¹, Fan Bu², Akihiko Nishimura³, Marc A. Suchard²,³,⁵

adjusting for both sequential testing and systematic error in safety surveillance using observational data: Empirical calibration and MaxSPRT in Statistics in Medicine.

Post-approval safety surveillance of medical products using observational healthcare data can help identify safety issues beyond those found in pre-approval trials. When testing sequentially as data accrue, maximum sequential probability ratio testing (MaxSPRT) is a common approach to maintaining nominal type I error. However, the true type I error may still deviate from the specified one because of systematic error due to the observational nature of the analysis. This systematic error may persist even after controlling for known confounders. Here we propose to address this issue by combining MaxSPRT with empirical calibration. In empirical calibration, we assume uncertainty about the systematic error in our analysis, the source of uncertainty commonly overlooked in practice. We infer a probability distribution of systematic error by relying on a large set of negative controls: exposure-outcome pairs where no causal effect is believed to exist. Integrating this distribution into our test statistics has previously been shown to restore type I error to nominal. Here we show how we can calibrate the critical value central to MaxSPRT. We evaluate this novel approach using simulations and real electronic health records, using H1N1 vaccinations during the 2009–2010 season as an example. Results show that combining empirical calibration with MaxSPRT restores nominal type I error. In our real-world example, adjusting for systematic error using empirical calibration has a larger impact than, and hence is just as essential as, adjusting for sequential testing using MaxSPRT. We recommend performing both, using the method described here.

Keywords
empirical calibration, observational research, sequential testing.
OHDSI Shoutouts!

Any shoutouts from the community? Please share and help promote and celebrate OHDSI work!

Have a study published? Please send to sachson@ohdsi.org so we can share during this call and on our social channels. Let’s work together to promote the collaborative work happening in OHDSI!
Three Stages of The Journey

Where Have We Been?
Where Are We Now?
Where Are We Going?
## Upcoming Workgroup Calls

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<th>Date</th>
<th>Time (ET)</th>
<th>Meeting</th>
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<tr>
<td>Tuesday</td>
<td>1 pm</td>
<td>Common Data Model</td>
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<tr>
<td>Wednesday</td>
<td>11 am</td>
<td>Open-Source Community</td>
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<td>Wednesday</td>
<td>12 pm</td>
<td>Health Equity Journal Club</td>
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<td>Thursday</td>
<td>12 pm</td>
<td>HADES</td>
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<tr>
<td>Thursday</td>
<td>1 pm</td>
<td>OMOP CDM Oncology – Vocabulary/Development</td>
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<td>Thursday</td>
<td>7 pm</td>
<td>Dentistry</td>
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<td>Friday</td>
<td>9 am</td>
<td>GIS – Geographic Information System Development</td>
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<td>Friday</td>
<td>11 am</td>
<td>Clinical Trials</td>
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<td>Monday</td>
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<td>Monday</td>
<td>11 am</td>
<td>Early-Stage Researchers</td>
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<tr>
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[ohdsi.org/workgroups](https://www.ohdsi.org/workgroups)
** OHDSI HADES releases: SqlRender 1.11.1 **

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** SqlRender **

[SqlRender 1.11.1](https://www.ohdsi.org/sqlrender)  
Reference  
SqlDeveloper  
Changelog

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** Introduction **

This is an R package for rendering parameterized SQL, and translating it to different SQL dialects. SqlRender can also be used as a stand-alone Java library and a command-line executable.

** Features **

- Supports a simple markup syntax for making SQL parameterized, and renders parameterized SQL (containing the markup syntax) to executable SQL.  
- The syntax supports defining default parameter values.  
- The syntax supports if-then-else structures.  
- Has functions for translating SQL from one dialect (Microsoft SQL Server) to other dialects (Oracle, PostgreSQL, Amazon RedShift, Impala, IBM Netezza, Google BigQuery, Microsoft PDW, Snowflake, Azure Synapse, Apache Spark and SQLite).  
- Can be used as R package, Java library, or as stand-alone executable through a command-line interface.
EvidenceSynthesis

EvidenceSynthesis is part of HADES.

Introduction

This R package contains routines for combining causal effect estimates and study diagnostics across multiple data sites in a distributed study. This includes functions for performing meta-analysis and forest plots.

Features

- Perform a traditional fixed-effects or random-effects meta-analysis, and create a forest plot.
- Use non-normal approximations of the per-data-site likelihood function to avoid bias when facing small and zero counts.

Example
SelfControlledCaseSeries

SelfControlledCaseSeries is part of HADES.

Introduction

SelfControlledCaseSeries is an R package for performing Self-Controlled Case Series (SCCS) analyses in an observational database in the OMOP Common Data Model.

Features

- Extracts the necessary data from a database in OMOP Common Data Model format.
- Optionally add seasonality using a spline function.
- Optionally add age using a spline function.
- Optionally add calendar time using a spline function.
- Optionally correct for event-dependent censoring of the observation period.
- Optionally add many covariates in one analysis (e.g., all drugs).
- Options for constructing different types of covariates and risk windows, including pre-exposure windows (to capture contraindications).
Jenna Reps, co-lead of the PLP workgroup, recently shared several video tutorials of version 6 of the PatientLevelPrediction tool. The demos are available on both our website and our YouTube page.

**Videos**
- how to extract data and develop single model using PLP v6
- how to design prediction models and develop multiple models using PLP v6
- demonstrating the PLP v6 shiny app that enables users to interactively explore prediction model results
- how to use the new OHDSI R package Strategus and OHDSI modules to develop an OHDSI prediction development network study
- how to run an OHDSI prediction network study using the new Strategus approach

[ohdsi.org/plp-v6-demos/]
Oxford Real World Evidence Summer School

Oxford Summer School 2023: Real World Evidence using the OMOP Common Data Model

**COURSE DIRECTORS**

Daniel Prieto-Alhambra  
Professor of Pharmacoeconomics and Decisional Epidemiology

**COURSE ADMINISTRATOR**

Mahkameh Mafi  
Personal Assistant to Professor Prieto-Alhambra

**Brief Description:**

Our Real World Evidence Summer School will provide participants with the tools and concepts necessary to plan and execute Real World Evidence studies, with a focus on the use of the OMOP common data model. The course will have morning lectures followed by afternoon practicals where concepts discussed in the morning will be put in practice with hands-on sessions. Practical sessions will have two tracks: a) for those interested in the design of studies and use of existing analytical and data curation tools; and b) for more advanced data scientists and programmers interested in the development or modification of analytical code using R.

**Registration:** It is now open

**Venue:** Lady Margaret Hall Talbot Hall Theatre, Norham Gardens, Oxford OX2 6QA

**Date:** 19th- 23rd June 2023

For booking please use [Booking Information](#)

Please see the Preliminary Programme [here](#)

**AUDIENCE:**

Pharmacists, clinicians, academics (including statisticians, epidemiologists, and related MSc/PhD students); Industry (pharmacy or device) or Regulatory staff with an interest in the use of routinely collected data for research.

**LEARNING GOALS:**

**OTHER COURSES**

Statistics: Designing clinical research and biostatistics
OHDSI Calendar of collaboration opportunities
ICPE 2023 Abstract Deadline: Feb. 13

ICPE 2023 Call for Abstracts
Submission Deadline: February 13, 2023

Abstract submissions for the 39th International Conference on Pharmacoepidemiology and Therapeutic Risk Management (ICPE 2023) are now being accepted online.

Call for Abstracts
ICPE 2023 will be a live event held at the Halifax Convention Centre, Halifax, Nova Scotia, Canada, August 23-27, 2023. Virtual presentations are not permitted for the event; all presentations must be delivered in person. If you submit an abstract, it is with the intention that you will physically attend the conference to present it.

The ICPE 2023 is a unique forum for the exchange of scientific information from the fields of pharmacoepidemiology and therapeutic risk management among those in the pharmaceutical industry, government, academia, service.

pharmacoepi.org/meetings/annual-conference/
Extending the OMOP Standard Vocabulary to Include Botanical Natural Products

Sanya B. Taneja, Mary F. Paine, Sandra L. Kane-Gill, Richard D. Boyce

INTRODUCTION

OBJECTIVES: extend the OMOP vocabulary to include botanical natural products, their synonyms, and common names, and name variations in standard natural product compound databases.

1. Increase in coverage of natural products and their dietary supplements has led to obvious name conflicts.
2. spontaneous reporting systems (e.g., FARES) can be used for natural product pharmacovigilance by identifying reports from natural products.

METHODS

Objective: to extend OMOP vocabulary to include botanical natural products. We searched clinical trial data sources, the names of synonyms, scientific names, and common names of botanical natural products using standard databases.

RESULTS

- 303 unique natural products (Lutrients exclude).
- 2,289 unique concepts in concept tables.
- 2,772 unique concept names for 62 natural products from FARES.

Relationships: seed, root, leaf, pod, blo, corn, seed, pod, blo, corn, seed, root, leaf, pod, etc.

Outcomes:
- 47,240 reports matched to natural product names.
- 48,292 reports matched to natural product compound names.
- 8,988,952 reports matched to natural product concepts.

Includes relationships to natural product constituents and RxNorm concepts.

TUESDAY

Extending the OMOP Standard Vocabulary to Include Botanical Natural Products (Sanya B. Taneja, Mary F. Paine, Sandra L. Kane-Gill, Richard D. Boyce)

303 botanical natural products, 2,289 concepts, and 2,772 name variations added to extended OHDSI vocabulary.

160,745 adverse event reports identified using terms for 65 natural products from the extended vocabulary.
PHOEBE 2.0: selecting the right concept sets for the right patients using lexical, semantic, and data-driven recommendations (Anna Ostropolets, George Hripcsak, Christopher Knoll, Patrick Ryan)
Adaptation and Validation of the Charlson Comorbidity Index in Administrative Claims Data Using the SNOMED CT Standardized Vocabulary

**Background**

- The Charlson Comorbidity Index (CCI) is commonly used in epidemiological research providing an estimate of the severity of comorbidities.
- The CCI has been adapted for administrative claims data using the International Classification of Diseases, Ninth and Tenth Revision (ICD-9/CV) and their clinical extensions (ICD-9/CR).
- Basic adaptation methods describing the development and validation of the current implementation of the CCI used in the OHDSI community. Prior research has shown large discrepancies in the CCI scores across different datasets.

**Study Objectives**

- To address the limitations of the OHDSI adaptation, the current study adapted and validated a new scoring engine for the CCI using the SNOMED CT standardized vocabulary.
- Researchers referred to the SNOMED adaptation.

**Methods**

- Development of SNOMED CT Adaptation:
  - Adapted through direct translation of CCI coding algorithms followed by manual scrutiny by clinical subject matter experts
  - Coding Engine:
    - For transitions between SNOMED CT and CCCI, several identified and classified into the following categories:
      - Multiple ICD codes to single SNOMED CT codes
      - Single ICD code to multiple SNOMED CT codes
      - Added Notes: Discrepancy codes are not clinically relevant
      - Replaced ICD codes mapped to SNOMED CT codes
      - Specificity of CCI codes mapping to SNOMED CT codes

- Validation of SNOMED CT Adaptation:
  - Test-Driven Changes: Changes driven by clinical reviewers and users across administrative claims databases
  - SNOMED CT Domains: Data at the level of codes
  - OHDSI Social Showcase: Data at the level of codes

**Statistical Analysis**

- All analyses were stratified by database and calendar year.
- Descriptive statistics were performed for each study variable.
- Differences between study comparisons were evaluated using chi-squared tests.
- For each calendar year, the overlap in patient capture between the SNOMED CT and CCCI adaptations between study comparisons were measured.
- Linear regression was used to predict 1-year mortality using the CCI as the independent variable. The performance of each version was assessed using the r-squared statistic, measured as the area under the receiver operating characteristic curve.

**Conclusions**

The SNOMED CT adaptation has similar performance to the CCCI adaptation in terms of measuring the overall CCI, frequency of individual conditions comprising the CCI, and predicting one-year mortality among hospitalized patients. Given the SNOMED CT adaptation permits for increased reproducibility and transparency of research, we posit the SNOMED CT adaptation as a substantial improvement to the current implementation of the CCI used by OHDSI.

**Results**

As above in Table 1, among 5,411 cases mapping to ICD-9/CR codes from either the SNOMED CT or CCI (2013, 2014, 2015, 2016, 2017, 2018), 2,790 (51.2%) were also detected by the SNOMED CT adaptation.

- Table 1: Performance of the SNOMED CT adaptation vs. CCCI adaptation per year mortality across all calendar years.

**Adaptation and Validation of the Charlson Comorbidity Index in Administrative Claims Data Using the SNOMED CT Standardized Vocabulary**

*Stephen Fortin, Jenna Reps, Patrick Ryan*
FeederNet (Federated E-Health Big Data for Evidence Renovation Network) platform in Korea (Seongwon Lee, Chungsoo Kim, Junhyuk Chang, Rae Woong Park)

CDM data-network of 57 hospitals and 73M patients' medical data was established in South Korea. Currently, joint research using it have been being actively conducted; 97 papers since 2017 and 55 papers in only 2021 were published by Korean first authors.
Where Are We Going?

Any other announcements of upcoming work, events, deadlines, etc?
Three Stages of The Journey

Where Have We Been?
Where Are We Now?
Where Are We Going?
A single winning ticket for Friday’s $1.35 billion Mega Millions jackpot drawing was sold in Maine

By Tina Burnside and Aya Elamroussi, CNN
Updated 5:50 AM EST; Sat January 14, 2023
Speed dating questions – Session 1

• What’s your name?

• Where do you live?

• What organization(s) are you affiliated with?

• Where are you on the OHDSI journey?

• If Andrew did win the Mega Millions, how much should he invest in OHDSI and what should the money fund?
Speed dating questions – Session 2

• What’s your name?
• Where do you live?
• What organization(s) are you affiliated with?
• Where are you on the OHDSI journey?
• If YOU won the Mega Millions, what would be your first big splurge purchase for yourself?
Speed dating questions – Session 3

- What’s your name?
- Where do you live?
- What organization(s) are you affiliated with?
- Where are you on the OHDSI journey?
- What type of collaboration are you hoping to engage in with fellow OHDSI colleagues this year?
Speed dating questions – Session 4

• What’s your name?

• Where do you live?

• What organization(s) are you affiliated with?

• Where are you on the OHDSI journey?

• What was your 2023 New Year’s Resolution and (be honest!) have you kept it through 17 days?