Happy 10th Birthday OHDSI!

OHDSI Community Call
Dec. 12, 2023 • 11 am ET
# Upcoming Community Calls

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 12</td>
<td>Happy Birthday OHDSI! Where Have We Come In 10 Years, and in 12 Months?</td>
</tr>
<tr>
<td>Dec. 19</td>
<td>Holiday-Themed Goodbye to 2023!</td>
</tr>
<tr>
<td>Dec. 26</td>
<td>No Call</td>
</tr>
<tr>
<td>Jan. 2</td>
<td>No Call</td>
</tr>
<tr>
<td>Jan. 9</td>
<td>Welcome Back! What Can OHDSI Accomplish in 2024?</td>
</tr>
</tbody>
</table>
Three Stages of The Journey

Where Have We Been?
Where Are We Now?
Where Are We Going?
Congratulations to the team of Marek Oja, Sirli Tamm, Kerli Mooses, Maarja Pajusalu, Harry-Anton Talvik, Anne Ott, Marianna Laht, Maria Malk, Marcus Lõo, Johannes Holm, Markus Haug, Hendrik Šuvalov, Dage Särg, Jaak Vilo, Sven Laur, Raivo Kolde, and Sulev Reisberg on the publication of Transforming Estonian health data to the Observational Medical Outcomes Partnership (OMOP) Common Data Model: lessons learned in JAMIA Open.
OHDSI Shoutouts!

Congratulations to the team of Varvara Kalokyri, Haridimos Kondylakis, Stelios Sfakianakis, Katerina Nikiforaki, Ioannis Karatzanis, Simone Mazzetti, Nikolaos Tachos, Daniele Regge, Dimitrios Fotiadis, Konstantinos Marias, and Manolis Tsiknakis on the publication of MI-Common Data Model: Extending Observational Medical Outcomes Partnership-Common Data Model (OMOP-CDM) for Registering Medical Imaging Metadata and Subsequent Curation Processes in JCO Clinical Cancer Informatics.
Congratulations to the team of Kyungseon Choi, Sang Jun Park, Sola Han, Yongseok Mun, Da Yun Lee, Dong-Jin Chang, Seok Kim, Sooyoung Yoo, Se Joon Woo, Kyu Hyung Park, and Hae Sun Suh on the publication of Patient-Centered Economic Burden of Exudative Age-Related Macular Degeneration: Retrospective Cohort Study in *JMIR Public Health and Surveillance*. 

**Abstract**

**Background**: Exudative age-related macular degeneration (AMD), one of the leading causes of blindness, requires expensive drugs such as anti-vascular endothelial growth factor (VEGF) agents. The long-term regular use of effective but expensive drugs causes an economic burden for patients with exudative AMD. However, there are no studies on the long-term patient-centered economic burden of exudative AMD after reimbursement of anti-VEGFs.

**Objective**: This study aimed to evaluate the patient-centered economic burden of exudative AMD for 2 years, including nonreimbursement and out-of-pocket costs, compared with nonexudative AMD using the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM).
Three Stages of The Journey

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Time (ET)</th>
<th>Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>3 pm</td>
<td>OMOP CDM Oncology – Outreach/Research Subgroup</td>
</tr>
<tr>
<td>Wednesday</td>
<td>9 am</td>
<td>Patient-Level Prediction</td>
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<tr>
<td>Wednesday</td>
<td>1 pm</td>
<td>Perinatal &amp; Reproductive Health</td>
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<tr>
<td>Wednesday</td>
<td>2 pm</td>
<td>Natural Language Processing</td>
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<tr>
<td>Wednesday</td>
<td>4 pm</td>
<td>Vulcan/OHDSI Meeting</td>
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<tr>
<td>Wednesday</td>
<td>7 pm</td>
<td>Medical Imaging</td>
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<tr>
<td>Thursday</td>
<td>8 am</td>
<td>India Chapter</td>
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<tr>
<td>Thursday</td>
<td>9:30 am</td>
<td>Data Network Quality</td>
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<tr>
<td>Thursday</td>
<td>7 pm</td>
<td>Dentistry</td>
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<tr>
<td>Friday</td>
<td>9 am</td>
<td>GIS – Geographic Information System General</td>
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<tr>
<td>Friday</td>
<td>10:30 am</td>
<td>Open-Source Community</td>
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<tr>
<td>Friday</td>
<td>11 am</td>
<td>Clinical Trials</td>
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<tr>
<td>Friday</td>
<td>11:30</td>
<td>Steering Group</td>
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<tr>
<td>Monday</td>
<td>10 am</td>
<td>Healthcare Systems Interest Group</td>
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<tr>
<td>Monday</td>
<td>11 am</td>
<td>Data Bricks User Group</td>
</tr>
<tr>
<td>Tuesday</td>
<td>10 am</td>
<td>Registry</td>
</tr>
</tbody>
</table>
DatabaseConnector

OHDSI HADES releases: DatabaseConnector 6.3.2

Introduction

This R package provides functions for connecting to various DBMSs. Together with the SqlRender package, the main goal of DatabaseConnector is to provide a uniform interface across database platforms: the same code should run and produce equivalent results, regardless of the database back end.

Features

- Create connections to the various database platforms:
  - MicrosoftSQL Server
  - Oracle
  - PostgresSql
  - Microsoft Parallel Data Warehouse (a.k.a. Analytics Platform System)
  - Amazon Redshift
  - Apache Impala
  - Google BigQuery
OHDSI HADES releases: SelfControlledCaseSeries 5.1.0

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).
OHDSI HADES releases: DeepPatientLevelPrediction 2.0.2

SelfControlledCaseSeries

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Title: From OMOP to CDISC SDTM: Successes, Challenges, and Future Opportunities of Using EHR Data for Drug Repurposing in COVID-19

**INTRODUCTION:**
- **Goal:** Evaluate the feasibility of converting between OMOP and SDTM.
- **Aim:** Simplify the process of converting between the OMOP CDM and CDISC SDTM, and launch similar work to increase interoperability between data models.
- **Method:** Derivation of logic to support conversion.
- **Impact:** Increase interoperability between commonly used data models.

**METHODS:**
1. Support plug-in that utilizes Edge Tool to convert ETL data into OMOP CDM.
2. Identify 22 critical variables to study COVID-19 through expert consensus.
3. Generate derivation logic to map 22 concepts from the pilot dataset to a subset of variables and their SDTM counterparts.
4. Incorporate derived logic on their tabularization and utilization of different variables.

**RESULTS:**
- We demonstrate the ability to map 21 critical variables between the OMOP CDM and CDISC SDTM through the construction of a limited, cross-sectional analysis dataset.

**CONCLUSIONS:**
- Several factors influenced the difficulty of conversion:
  - Missing data
  - Inconsistency between OMOP and SDTM concepts
  - Complex variable definitions
  - NVivo - high variability in blood pressure, height, as well as inconsistence measurement units from the data and complex derivation process

- Due to missing variables during data transfer, some initially identified mappings could not be defined.
- Through this project, all patient records were successfully made available in CDISC SDTM format through the Infectious Disease Data Observation (IDDO)
- Long-term goal is to increase the availability of COVID-19 data and extend the work into the outcomes of COVID-19 and into other critical care and new disease scenarios.

**ACKNOWLEDGMENTS:**
Wesley Anderson, Ruth Kurtycz, Tahsin Farid, Shermarme Hassan, Kalynn Kennon, Pam Dasher, Danielle Boyce, Will Roddy, Smith F. Heavner
Mapping gravity value sets to OMOP CDM: The case of the food insecurity screening

(Adam Bouras, Davera Gabriel)

INTRODUCTION

The Office of the National Coordinator for Health IT (ONC) launched the USDII and USDII+ initiatives to establish domain, and program-specific datasets. As part of these initiatives, the ONC has developed data element lists for the following subdomains supporting Public Health programs: Case-Based Surveillance, Laboratory Data Exchange, Multi-Directional Exchange with Healthcare and Other Partners, Resource Reporting and Situational Awareness, and Risk Behavior and Drivers of Inequity Data elements. Supporting the ONC aims, the HL7 Gravity Accelerator developed Social Determinants of Health (SDOH) Value Sets in response. However, only a handful of studies have been published to date on the standards-based representation of SDOH screening tools. Further, these have yet to demonstrate that the SDOH standards could be used with real-world data for data exchange between sites using different Common Data Models, with a few exceptions.

METHODS

1. Identified the assessment tools related to the SDOH developed by the Gravity project
2. Manually mapped food insecurity tool using Athena to OMOP CDM
3. Conducted a text similarity analysis to assess the semantic substitutability between screen tools mapped with non-mapped tools

Dr. Bouras would like to acknowledge the support of Dr. Davera Gabriel and the OHDSI OMOP + FHIREWG in developing this submission.
Enhancing Precision and Validity: Leveraging Multiple Error-Prone Phenotypes in EHR-Based Association Studies

(Yiwen Lu, Jiayi Tong, Rebecca A Hubbard, Yong Chen)

WEDNESDAY

Background
Objective: Present a novel bias-correction approach that harnesses the collective power of all available phenotypes derived from multiple algorithms.

Why do we study this?
- Manual chart review are often constrained by time and cost limitations.
- Cannot get true estimation directly.

Methods

Comparison between existing methods

<table>
<thead>
<tr>
<th>Description</th>
<th>Pros and cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method 1</td>
<td>use validation set only</td>
</tr>
<tr>
<td>Method 2</td>
<td>use full surrogates only</td>
</tr>
<tr>
<td>Method 3 (Ours)</td>
<td>Augmented estimation with single surrogate</td>
</tr>
</tbody>
</table>

Proposed method

Algorithm
1. Obtain individual phenotype $A_i$ using validation set.
2. Compute emission probability of $A_i$.
3. Mix the proposed correction and remove variance to get $A_{prop}$.

Simulation Settings

- Two major settings: non-differential (setting A) and differential (setting B) misclassifications.
- Two cases: independent surrogate (Case 1) and correlated surrogates (Case 2).
- Simulated estimation using different number of surrogates (two to five).
- Complete data set of 3 sites (4000, 5000, and 10000) with the validation set of 4 sites (400, 600, 1000, and 1500).
- The complete set of validation ratios in our study ranged from 0.04 to 0.4.

Real Data Evaluation
- Data source: Kaiser Permanente Washington (KPH) healthcare system.
- Study cohort: 1086 patients aged 18 or older at the time of diagnosis of stage I-IVA colon cancer between 1995 and 2014.
- Result: We included two algorithm-derived phenotypes and compared the point estimates and 95% confidence intervals (CI) for the association (in log odds ratio scale) between survivors and the occurrence of colon events using different methods, where the validation ratio is approximately 0.3.

Conclusion
- We have presented an augmented estimation procedure that effectively addresses both non-differential and differential misclassifications by leveraging the full potential of multiple independent or correlated algorithm-derived phenotypes.
- Our method is applicable to OHDSI data.
- Our novel bias-correction approach enhances the efficiency of estimation, contributes to the reliability and reproducibility of findings, and ultimately fosters progress in evidence-based healthcare and population health research.

References
1. Yiwen Lu, Jiayi Tong, Rebecca A Hubbard, Yong Chen, Jia Li, Yucang Wang, Yiwen Li, et al. Evaluating the E-RP2N Case Definitions for Chronic Disease Surveillance in a Large EHR-Based Registry. JMIR Medical Informatics 2019;7(2). e13004. 

Contact: yiwenl123@open.edu, yiwenga@kaiser.com
Enabling Innovation at the Bedside using STARR-OMOP

Priya Desai1,2, Alison Callahan1,2, Juan M. Banda2, Nikesh Kotecha2, Shreya Shah1, Somalee Datta1,2

1Stanford School of Medicine, 2Stanford Health Care

Background

Data coupled with artificial intelligence(s) and machine learning(s) can advance both the science and practice of medicine. Large amounts of patient data are now available due to the widespread adoption of electronic health records (EHRs), including imaging data from radiology and pathology etc. Academic Medical Centers (AMCs) are increasingly focusing on creating data repositories to harness these data for research that translates to the bedside.

The STARR-OMOP (Open Medical Open-Source Research) initiative was launched by Stanford Medicine Research Technology team, a unit that supports research at Stanford School of Medicine (SSM), Stanford Health Care (SHC) and Stanford Children’s Health (SCH). STARR-OMOP hosts multiple linked clinical data warehouses with a range of data types, all in one place on the cloud. STARR contains structured and unstructured, raw and “analytic-ready” data as well as tools to analyze these data. STARR datasets, the ETLs that connect the raw data to analysis-ready forms, and Ners, our secure research computing platforms are all hosted on a public cloud, specifically, the Google Cloud Platform. The value of this platform is to provide researchers with the access and tools to easily explore clinical data securely and accelerate the pace of bench to bedside research.

Methods

STARR-OMOP is a clinical data warehouse supported by STARR containing EHR data from the two hospitals standardized to OHDSI OMOP Common Data Model. This data warehouse contains data for ~13.7 million patients and is refreshed weekly. A PH-escrowed version of STARR-OMOP is made available for db and population health research. The data can be accessed programmatically (i.e. SQL queries) from Stanford’s secure Big Data Computing platforms, Ners Cloud and its on-premise counterpart Carrina, or analyzed using cohort tools (e.g., OHDSI ATLAS, ACE).

The STARR-OMOP datamart resides on BigQuery, Google’s fully-managed cloud data warehouse, in Research Technology platform Google Cloud Platform(GCP) projects, and users have only read access to the PHI scrubbed STARR-OMOP data via a virtual Private Cloud(VPC) bridge from their own GCP project. This setup allows our data and compute resources to remain secure, while providing researchers with a high-performance computing platform that can scale.

The typical workflow for a dbA mentor is to request a Ners GCP project with access to STARR data (radiology images, EHR data in OMOP eq), and once that has been made available, they can start exploring the data, testing their models and hypotheses. Hospital data scientists across the relevant STARR OMOP datasets (PHI or PH scrubbed) from secure GCP projects that are managed by the Research Technology team.

Contact: pri@stanford.edu

THURSDAY

Enabling Innovation at the Bedside using STARR-OMOP

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Contact: pri@stanford.edu

Impacting patient care using real world data

STARR-OMOP has enabled cutting-edge research that is of high practical value to Stanford Medicine. Two examples:

1. Preventing real-world evidence at the bedside through consultation service

The Green Button project at Stanford Medicine leveraged observational patient data (in the OMOP CDE) to plot an incremental consultation service for providers, and researchers to answer questions about patient care and outcomes. For each consultation request, custom patient cohorts were created, appropriate statistical analyses designed, summarized, and shared back with the requestor. The service used the MassMutual Cloud Engine (MCE), a search engine that operates over STARR-OMOP, to define and retrieve patient cohorts. An IRB approved pilot study of the service1 found that evidence derived from observational data can fill important gaps in clinical knowledge which directly impact patient care. The service was commercially launched by Atrius Health in 2020 and now serves a number of health systems.

2. Developing a Clinical Decision Support Tool to identify Risks and Care Gaps in Primary Care

The SHC-Applied Research Team (HART) & CoCure Health have developed an AI risk-prediction tool trained on a STARR-OMOP dataset of over 70,000 primary care patients spanning seven years (2015-2022), to identify patients at high risk for ED visits and hospitalizations2. The tool linguistic-COPD data to calculate risk metrics and display patient risk scores with temporal evolution as well as clinical recommendations based on identified care gaps. A pilot is underway to better understand the feasibility and acceptability of the tool among clinical teams in primary care.

Assessing ML guided workflows at Stanford Health Care

The primary goal of the SHC Data Science team is to design & build infrastructure to support rapid deployment of ML systems which aid health care delivery and operations and develop processes to evaluate the value of ML-guided workflows being considered for deployment in SHC. STARR-OMOP provides crucial data about patients & their outcomes to assess the ML model’s potential fairness, reliability3 and usefulness4 for patients and providers. These assessments inform deployment strategies and resource allocation for ML projects at SHC, and we are actively evaluating if models built using retrospective STARR-OMOP data can be used in real time at the point of care using EHR-FHIR integration APIs.

References

Guidance for Communication of the OHDSI Network Study Approach with Institutional Review Boards

**Presenters:** Ben Martin, Mary Grace Bowring, Paul Nagy

**Guidance for Communication of the OHDSI Network Study Approach with Institutional Review Boards**

**INTRO**
Due to laws of data security and regulatory requirements around protected health information (PHI), institutional review boards (IRB) have a routine obligation to ensure proper handling of PHI involved in studies using real world data (RWD).

The revised regulations combined with inter-institutional coordination amongst researchers using secondary RWD present an opportunity to maximize the time between study conception and data analysis for network studies.

**OBJECTIVE**
To provide guidance for clear communication of federated methods and data governance considerations of OHDSI network studies to local Institutional Review Boards.

**METHODS**
A review of OHDSI network study documentation, educational media, and researcher experience was performed.

Results were refined to provide consistent language and key communication points for use with IRB personnel and when submitting study protocols to data partners’ local Institutional Review Boards.

**Standardization of Language**
When communicating network study methods facilitates coordination with IRBs across federated governance structures.

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**RESULTS**
Key language and communication points for participating data partners to share with local IRBs:

- The OMOP CDM has mapped patient identifiers and should be considered a limited data set.
- Shift and truncate (SANT) methods are available to conduct randomizing data shifts for each patient while preserving temporal relationships.
- Each participating network site must register the study with their local IRB, if required by institutional governance.
- The study protocol document with rationale, background, objectives, methods, data analysis plan, and measures for protection of human subjects are published publicly on the OHDSI Studies GitHub under the corresponding study folder at https://github.com/ohdsi-studies.
- Raw level patient data is never shared across separate institutions participating in a network study. Results are calculated behind the firewall of each site and aggregated before sharing.
- At each data evaluation stage prior to generation of results (i.e., data diagnostics, phenotype evaluation, and study diagnostics) only aggregate evaluations are observed by the external network study lead. Patient-level data is never shared between data partners at any point during the network study process.
- Each network site study issues will have to work with their local IRB to install any dependent R packages needed to execute the OHDSI network study packages. Ensure this is permitted by local data security and governance rules.
- Check with your local governance team to ensure that any agreements need to be executed for sharing the aggregated results.
Strategus sub-team formation

In the HADES Working Group, we’ve discussed and decided to form a sub-team focused on the design of Strategus software for OHDSI network studies. There has been a lot of discussion of Strategus here on the forums link, in the HADES workgroup, the Save Our Sisyphus Challenge, the 2023 OHDSI Hack-a-thon and of course on the Strategus GitHub Issue Tracker.

Now we’d like to formalize the work around the Strategus project into a sub-team of the HADES Working Group and we want to open this up to developers in the OHDSI community that are interested in collaborating. I have opened a poll on the HADES Working Group OHDSI Teams Channel to see who is interested in meeting and some options for meeting days/times. Please feel use that link to vote and to join the sub-team! I’m aiming to start this sub-team in January 2024.

(If you don’t have access to the OHDSI Teams environment, please see: OHDSI Workgroups – OHDSI and click the “Join A Workgroup” link)
Opening: Limerick Digital Cancer Research Centre

Job Spec

Advertisement/Information for Applicants
Please click on Information for Applicants/Job Description link below for full job

Post Doctoral Researcher (Level 1 or 2) in Cancer Digital Health Real World Evidence (2 Positions)

With over 16,000 students and 2,600 members of staff, the University of Limerick (UL) is an energetic, research-led and enterprising institution with a proud record in innovation and excellence in education, research and scholarship. The dynamic, entrepreneurial and pioneering values which drive UL’s mission and strategy ensure that we capitalise on local, national and international engagement and connectivity. We are renowned for providing an outstanding student experience and conducting leading-edge research. Our commitment is to make a difference by shaping the future through educating and empowering our students.

With the River Shannon as a unifying focal point, UL is situated on a superb riverside campus of over 133 hectares. Outstanding recreational, cultural and sporting facilities further enhance the campus’s exceptional learning and research environment.

Applications are invited for the following position:

Faculty of Education & Health Sciences
School of Medicine

Post Doctoral Researcher (Level 1 or 2) in Cancer Digital Health Real World Evidence (2 Positions) Specific Purpose Contract

Salary Scales: PD1 €42,033 - €48,427 p.a. pro rata
PD2 €49,799 - €54,153 p.a. pro rata

Informal enquiries regarding the post may be directed to:
Professor Aidan Cunhane
School of Medicine
University of Limerick
Email: aiden.cunhane@ul.ie

“This is a professional training and development role and the training and development relevant to this position will be completed within the period of the contract. Postdoctoral Researchers appointed will be expected to complete the Researcher Career Development Programme.”

The closing date for receipt of applications is Friday, 15th December 2023.

Applications must be completed online before 12 noon, Irish Standard Time on the closing date.

The University of Limerick supports blended working.
Openings: Bill and Melinda Gates Foundation

Distinguished Scientist, Artificial Intelligence & Large Language Models
Apply

Deputy Director, Quantitative Sciences
Apply
Open Postdoctoral position, faculty mentor Brian Bateman

Our research team is looking for a postdoctoral scholar in perinatal pharmacoepidemiology. The scholar will work closely with Drs. Brian Bateman and Stephanie Leonard on NIH-funded research projects on the comparative safety and effectiveness of medications in pregnancy and related research topics. Our projects employ advanced analytical methods in large databases, which include claims data and electronic health record data in conventional structures and in common data models. Current topical focus areas include mental health, behavioral health and cardiovascular health of people who are pregnant or postpartum.

Our research group prioritizes a collaborative and inclusive team environment. The principal investigators are experienced mentors who are highly committed to supporting the postdoctoral scholar in advancing their career as a future independent investigator. The
Where Are We Going?

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

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Dec. 12: Happy 10th Birthday to OHDSI