10-Minute Tutorials

OHDSI Community Call
May 14, 2024 • 11 am ET
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>May 14</td>
<td>10-Minute Tutorials</td>
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<tr>
<td>May 21</td>
<td>Open Studies in the OHDSI Community</td>
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<td>May 28</td>
<td>Collaborator Showcase Brainstorm</td>
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<td>June 4</td>
<td>NO CALL – EUROPEAN SYMPOSIUM</td>
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<td>European Symposium Review</td>
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<td>Application of LLMs In Evidence Generation Process</td>
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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>
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<tbody>
<tr>
<td>Tuesday</td>
<td>12 pm</td>
<td>Generative AI and Analytics</td>
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<td>Tuesday</td>
<td>6 pm</td>
<td>Eyecare &amp; Vision Research</td>
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<td>Wednesday</td>
<td>7 am</td>
<td>Medical Imaging</td>
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<td>Wednesday</td>
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<td>Joint Vulcan/OHDSI Meeting</td>
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<td>Thursday</td>
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<td>India Community Call</td>
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<td>Thursday</td>
<td>9 am</td>
<td>Medical Devices</td>
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<td>Thursday</td>
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<td>OMOP CDM Oncology Vocabulary/Development Subgroup</td>
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<td>Thursday</td>
<td>10 am</td>
<td>Rehabilitation</td>
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<td>Thursday</td>
<td>12 pm</td>
<td>HADES</td>
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<td>Thursday</td>
<td>7 pm</td>
<td>Dentistry</td>
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<td>Friday</td>
<td>10 am</td>
<td>GIS-Geographic Information System</td>
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<tr>
<td>Friday</td>
<td>11:30 am</td>
<td>Steering Group</td>
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<tr>
<td>Monday</td>
<td>9 am</td>
<td>Vaccine Vocabulary</td>
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<td>Monday</td>
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<td>Healthcare Systems Interest Group</td>
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<td>Monday</td>
<td>11 am</td>
<td>Data Bricks User Group</td>
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<tr>
<td>Monday</td>
<td>2 pm</td>
<td>Electronic Animal Health Records</td>
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</table>
Next CBER Best Seminar: May 22

**Topic:** Reliability in Observational Research: Assessing Covariate Imbalance in Small Studies

**Presenter:** George Hripcsak, Vivian Beaumont Allen Professor of Biomedical Informatics, Columbia University

**Logistics:** 11 am – 12 pm EST, Zoom webinar

[ohdsi.org/cber-best-seminar-series](ohdsi.org/cber-best-seminar-series)
Kheiron Cohort Application Is Open

The Kheiron Cohort, now in its third year, is a program designed to onboard new contributors into OHDSI and empower them to become active contributors and maintainers.

**Career Development**
- training opportunities within the cohort from OHDSI technical leaders
- interaction and mentoring from OHDSI leadership

Applications are due June 1
Announcing the Maternal Health Data Science Fellowship

**Career Development**
- Create evidence from real-world data
- Leverage standard data models for reproducible research
- Build skills on effective network studies

**Practice**
- Design effective observational research protocols
- Master OHDSI tools
- Write papers & grants

**Networking**
- Build relationships with mentors & fellow learners
- Coordinate with colleagues in the OHDSI data network, spanning 450 sites worldwide & 960 million unique patients

Want to build your career? Generate reproducible evidence by leading multi-institutional studies!

Application deadline extended to Wednesday, May 22, 2024

Find out more and apply here by May 15th, 2024!
Top 10 Reasons to Apply for the Maternal Health Data Science Fellowship

1. If you want to make an impact on a major public health issue that’s complex to address
2. If you want to catalyze your career in maternal health research
3. If you want to learn how to conduct inter-institutional network studies
4. If you want to lead a publication on evidence generated via an OHDSI Network Study
5. If you want to be part of an active data network to create evidence at scale
6. If you want to become a leader in the OHDSI Community
7. If you want to learn how to do reproducible research
8. If you want personal career mentoring on publishing, writing grants, and research
9. If you want to learn team science
10. If you want to learn how to create validated cohorts
The Center for Advanced Healthcare Research Informatics (CAHRI) at Tufts Medicine welcomes:

Peter Robinson, MD
*Alexander von Humboldt Professor for AI*
*Berlin Institute of Health @ Charité*


May 30, 2024, 11am-12pm EST
Virtually via [Zoom](https://zoom.com)

Please contact Marty Alvarez at malvarez2@tuftsmedicalcenter.org for calendar invite or questions.
Registration is OPEN for the 2024 OHDSI Europe Symposium, which will be held June 1-3 in Rotterdam, Netherlands.

June 1 – tutorial/workshop  
June 2 – tutorial/workshop  
June 3 – main conference
#OHDSI2024 Registration Is Open!

Registration is now OPEN for the 2024 OHDSI Global Symposium, which will be held Oct. 22-24 at the Hyatt Regency Hotel in New Brunswick, N.J., USA.

**Tuesday:** Tutorials  
**Wednesday:** Plenary/Showcase  
**Thursday:** Workgroup Activities

[ohdsi.org/OHDSI2024]
#OHDSI2024 Collaborator Showcase

Submissions are now being accepted for the 2024 Global Symposium Collaborator Showcase.

All submissions are due by 8 pm ET on Friday, June 21.

Notification of acceptance will be made by Tuesday, Aug. 20.

[ohdsi.org/OHDSI2024]
Demonstrating Scalable Integration of Clinical, Translational, and Manufacturing Data to Explore Role of Manufacturing Approach in Driving Health Outcomes

**Demonstrating Scalable Integration of Clinical and Manufacturing Data to Explore Role of Manufacturing Approach in Driving Health Outcomes**

**PRESENTER:** Ben Smith

**Authors:** Ben Smith, Trent Peterson, Jessica Manzyuk, Principia Health Sciences, Cary, NC

**Introduction**

Interest is growing among cell therapy researchers to better understand relationships between manufacturing approaches and patient outcomes. Large multi-site research has been difficult to execute due to the significant effort required in linking clinical and manufacturing data sources. Collaborative observational research has benefited from growing adoption of the Fast Healthcare Interoperability Resources (FHIR) data standard and the Observational Medical Outcomes Partnership (OMOP) common data model (Figure 1). Automation of data acquisition and integration has been simplified through efforts to bridge FHIR and OMOP with the goal of extending similar benefits to research involving cell therapy manufacturing, we decided to explore the feasibility of using OMOP for integrated clinical and manufacturing datasets.

**Figure 1. Integrating multi-disciplinary data for CAR-T research**

**Methods**

Our team developed a categorized list of key variables used in cell therapy manufacturing (Figure 2), including process steps, equipment used, and common data outputs for quality monitoring. We then created a data dictionary including range and value distributions to support generation of synthetic data we could later use in technology development. Our integration approach leveraged OMOP’s FACT-RELATIONSHIP table to link specimen, patients, therapies, equipment, and process steps involved in cell therapy manufacturing and transport.

To visually demonstrate success, we connected the resulting database to an analysis application customized for OMOP-based cell therapy research. The tool allowed both manufacturing and clinical parameters to be used in defining a research cohort (e.g., multiple evaluable patients receiving CAR-T therapy where the transduction efficiency % during manufacturing was between 35% and 60%), and then conducted multiple descriptive and prescriptive analyses.

This analysis validated feasibility of storing manufacturing and logistics data within OMOP for linking with clinical data, leaving no ambiguity of data type or relationship to the patient. We are currently exploring pilots with multiple institutions to advance development of this technique.

**What is the impact of manufacturing approach on patient outcomes for cell and gene therapies?**

**Figure 2. Priority Cell Therapy Manufacturing Variables**

**Ben Smith, Trent Peterson, Jessica Manzyuk**
Examining differential measurement error due to race, age, and sex in mental health disorders using PheValuator

( Joel Swerdel, Dmytro Dymshyts)

Background:
- Misclassification of health condition status is a serious threat to valid inferences involving observational data drawn from administrative data sources.
- The problem would be exacerbated if there were differential misclassification between population subgroups.
- For example, within the degree of misclassification may vary across subgroups, which may vary by race, age, and sex.
- PheValuator is a methodology within the OHDSI toolbox that uses diagnostic predictions modeling to determine if a given covariate (e.g., race, age, sex) is a confounder of a treatment-outcome relationship in an observational data source. For example, it assesses if race is a confounder of the treatment-outcome relationship in the research question.

Methods:
- We developed phenotypic algorithms for eight major mental health disorders: anxiety, attention-deficit hyperactivity disorder (ADHD), autism spectrum disorder, depression, bipolar disorder, schizophrenia, and schizoaffective disorder.
- We examined these conditions in three databases which include subjects of all ages: IBM MarketScan Commercial and Medicare Supplemental Database, Optum Clininformatics DataMart (CDM), and UnitedHealth Group claims data.
- We stratified the subjects in the analysis by sex (male, female, and age groups: 65 years old and younger, 65-80 years old, and 80 years old and older) for each condition.
- We used PheValuator (version 2.2.3) for the analysis.
- We estimated and compared:
  - Sensitivity (true positives/true positives + true negatives) for each condition across the three databases.
  - PPV (true positives/true positives + false negatives) for each condition across the three databases.

Results:
- Researchers may introduce bias into their mental health research if they assume non-differential misclassification by sex, age, or race.

Conclusions:
- In this study we examined differences in the performance characteristics, sensitivity and PPV, of phenotypic algorithms for eight mental health disorders among subgroupspopulations divided by race, sex, and age.
- We found large differences in sensitivity and PPV for many of the conditions in each of the subgroups.
- These results highlight the need for further research examining sex, race, and age disparities in diagnosis and treatment of different mental health disorders. For example, we found that PheValuator had lower sensitivity for women compared to men for autism spectrum disorder, depression, and bipolar disorder. We also found that PheValuator had lower PPV for schizophrenia and bipolar disorder for the 65 and older age group compared to younger age groups.

#OHDSISocialShowcase This Week

Examining differential measurement error due to race, age, and sex in mental health disorders using PheValuator

Researchers may introduce bias into their mental health research if they assume non-differential misclassification by sex, age, or race.

Males: higher sensitivity estimates for:
- ADHD
- Autism
- Schizophrenia
- Schizoaffective disorder

Females: higher sensitivity estimates for:
- Anxiety
- Bipolar disorder
- Depression
- PTSD

Blacks: higher sensitivity estimates for:
- Schizophrenia
- Schizoaffective disorder

Whites: higher sensitivity estimates for:
- Anxiety
- Bipolar disorder
- Depression

Younger Subjects: higher sensitivity estimates for:
- Autism
- Bipolar disease
- PTSD
- Schizophrenia
- Schizoaffective disorder

TUESDAY

By Sex:
- By race:
- By age:

PPV: The differences were much smaller than PPV estimates between the groups examined for the same condition. For example, the differences were larger when comparing age groups.

REFERENCES:
- A.I. N. Swerdel* and Dmytro Dymshyts

@OHDSI www.ohdsi.org #JoinTheJourney
Treatment pattern of osteoporosis in postmenopausal women using OMOP CDM: A multi-center study

INTRODUCTION
- The prevention and treatment of osteoporosis, which causes bone loss, is crucial to mortality and quality of life in older adults.
- There are mainly two types of osteoporosis medications: antiresorptive agents include selective estrogen receptor modulators (SERMs), bisphosphonates (BPs), and teriparatide; osteoporosis promotors such as recombinant human parathyroid hormone 1-34 (rPTH), and the dual-action agent, denosumab.
- Denosumab, a novel anti-osteoporosis drug, is known to provide better adherence than BPs. However, changes in routine clinical practice remain unclear.

OBJECTIVE
- This study aimed to evaluate changes in the treatment patterns of osteoporosis treatment in postmenopausal women over the past decade following the approval (2012) and insurance coverage (2017) of denosumab, a novel anti-osteoporosis drug.
- The effectiveness of denosumab and BPs was compared to estimate osteoporotic fracture risk according to treatment changes.

METHODS
- This study used 3 OMOP-COM databases from Incheon University Hospital, Inha University Hospital, and Inje University Anar Hospital.

Treatment Patterns
- The population of interest includes 2151 women and 2 patients diagnosed with osteoporosis between 2012 and 2021.
- To account for the approval and insurance coverage of denosumab, patients were divided into three groups based on their diagnoses in 2012, 2017, 2018, 2019, 2020.
- Medication was defined as the group receiving SERMs, BPs (either PO or IV), denosumab, rPTH, and denosumab after the first diagnosis of osteoporosis as each.

WEDNESDAY

Treatment pattern of osteoporosis in postmenopausal women using OMOP CDM

(Dachung Boo, Seungjin Baek, Namki Hong, Yumie Rhee, Seng Chan You)
Unraveling the Mediating Role of Frailty: Understanding Health Care Utilization among Older Sexual and Gender Minority Adults in the All of Us Research Program

Presenter: Chelsea N Wong, MD
Contact: www.ohdsi.org/socialshowcase

Intro:
- Older sexual and gender minority adults (OSGM) face a higher burden of frailty and mental health conditions.
- Frailty is associated with higher health care utilization among the older heterosexual (non-OSGM) adults.
- How does frailty impact the association between sexual and gender minority (SGM) status and health care utilization?

Methods:
- Data: All of Us Version 6 Controlled Tier
- Participants: Adults ≥ 50 years old
- Survey Questions:
  - SGM self-identified via 3 questions:
    - Sex assigned at birth
    - Sexual Orientation
    - Gender Identity
  - Health care utilization: General doctor and mental health visits in the past year
- Frailty index: 23 items
- Analytic Marginal structural model to test whether frailty mediates the association between SGM status and health care utilization (Figure 1)

Figure 1: SGM of Mediation Analysis

Older sexual and gender minority adults have higher health care utilization regardless of frailty status

Table 2. Results of Marginal Structural Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Marginal Effect (SE)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSGM</td>
<td>1.67 (1.14)</td>
<td>0.066</td>
</tr>
<tr>
<td>Non-OSGM</td>
<td>1.26 (1.07)</td>
<td>0.036</td>
</tr>
</tbody>
</table>

Mental Health Visits

<table>
<thead>
<tr>
<th>Model</th>
<th>Marginal Effect (SE)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSGM</td>
<td>1.29 (1.28)</td>
<td>0.609</td>
</tr>
<tr>
<td>Non-OSGM</td>
<td>1.29 (1.28)</td>
<td>0.609</td>
</tr>
</tbody>
</table>

CONCLUSIONS:
- OSGM had higher health care utilization of general doctor and mental health visits compared to non-OSGM.
- OSGM have higher health care utilization regardless of frailty status.
- Among OSGM factors other than frailty may influence health care utilization.

NEXT STEPS:
- Assessing agreement in health care utilization measures from survey and electronic health record data.

Figure 2: Visits by Frailty and Sexual and Gender Minority Status

A. General Doctor Visits

B. Mental Health Visits
FRIDAY

GUSTO Data Vault: Laying the foundations for an open science system with OMOP Data Catalogue

Cindy Ho, Li Ting Ang, Maisie Ng, Hang Png, Shuen Lin Tan, Estella Ye, Sunil Kumar Raja, Mengling Feng, Johan G Eriksson, Mukkesh Kumar

GUSTO Data Vault: Laying the foundations for an open science system with OMOP Data Catalogue

**PRESENTER:** Cindy Ho, Mukkesh Kumar

**ABSTRACT:**
- Growing Up in Singapore Towards healthy Outcomes (GUSTO) aims to understand how conditions in pregnancy and early childhood influence the subsequent health and development of women and children.
- The A*STAR/GUSTO Data Vault platform has advanced data exploration capabilities for research data, biospecimens and publications asset management.
- The OMOP Data Catalogue was created in GUSTO Data Vault to showcase the GUSTO data which have been converted into OMOP CDIM format.

**METHODS:**
- Data Vault (containerized with application with Docker) was built using PostgreSQL database and Docker.
- Tools used: HTML, CSS, JavaScript, Java, Python, PHP, C/C++, Docker, container engine in Docker Enterprise, AWS Cloud Platform.
- OMOP fields were mapped using Athena and customised R programming script.

**RESULTS:**
- OMOP Data Catalogue makes GUSTO cohort-specific OMOP fields to be discovered across the Person, Condition, Observation and Measurement tables by the global research community.
- Metadata is described with relevant attributes such as CDIM Field, Concept ID, Name, Subject Type, Visit Timepoint, Description and Domain.
- Data profiling of the OMOP Concept XML enables GUSTO data to be reused, described, discovered, and identified by researchers following FAIR data principles.
- OMOPed data from incremental OMOP conversions can be seamlessly integrated in OMOP Data Catalogue by GUSTO data curators.
- This enables database level characterizations for GUSTO study.

GUSTO OMOP Data Catalogue lays the foundations for developing cross-study OMOP Data Catalogues expanded across APAC and global OHDSI data partners, enabling database level characterizations.
Openings: Postdoctoral Fellow, Johns Hopkins Univ.

PHARMA COEPIDEMIOLOGY POST-DOCTORAL TRAINING PROGRAM

Co-Directors: Caleb Alexander, MD, MS and Jodi Segal, MD, MPH

The Pharmacoepidemiology Training Program at the Johns Hopkins Bloomberg School of Public Health (BSPH) is currently seeking to support postdoctoral fellows. All supported trainees work with core faculty on existing or newly developed research projects on pharmacoepidemiology, so as to optimize the safe and effective use of medicines to treat heart, lung and blood diseases in the United States.

Deadline for applications: rolling
INFORMATICS

Research Services
COVID-19 Information and Resources
Data and Safety Monitoring Board (DSMB) Program
Center for Clinical Trials (CCT)
Program Evaluation
Qualitative and Mixed Methods Service
Clinical Trial Design Labs
Dissemination and Implementation (D&I) Core
Science Communications

“Our Informatics team can help you collect and manage research data, develop databases, and identify study participants. We’ll find the best data collection solution for your study. To get started, please submit a request below.”

William Harvey, MD, MSc, FACR
Co-Director, Informatics and Tufts Medical Center CMIO

Overview
We participate in development of a robust institutional informatics infrastructure, enabling research teams to maintain their focus on scientific discovery and analyses rather than on data wrangling. Our infrastructure and support systems are dynamic, to keep pace with the changing and interdependent fields of health informatics, bioinformatics, statistics, and data science; expandable, to accommodate new data types and analytic methods; and scalable, to support efficient and methodologically rigorous multisite/institution research. These defining traits allow us to elucidate novel methods and operational principles, harmonize datasets, and create pipelines for data sharing and analytics.
Job Details

Research Assistant in Health Data Sciences

Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Botnar Research Centre, Windmill Road, Oxford, OX3 7LD

We have an exciting opportunity for a Research Assistant in Health Data Sciences to join the Pharmacoe- and Device epidemiology research group led by Professor Daniel Prieto-Alhambra at the Botnar Research Centre, NOORMS, University of Oxford. The NOORMS Pharmacoe- and Device epidemiology research group is involved in a number of national and international studies exploring the conditions of use (adherence, compliance, off and on-label use) of a number of licensed drugs, devices, and vaccines for the prevention and treatment of human disease in ‘real-world’ (routine practice) conditions.

As a Research Assistant in Health Data Sciences you will contribute to the programming of analytical pipelines for the analysis of routinely collected data mapped to the OMOP Common Data Model. You will analyse real world data to address regulatory questions related to the prevalence/incidence of disease, use of medicines/vaccines, and the risks or benefits of medicines/vaccines or devices. You will prepare analytical packages to run a number of pre-specified analyses, contribute to wider project planning, including ideas for new research projects and gather, analyse, and present scientific data from a variety of sources.

You will hold a relevant BA or MSc degree in Mathematics, Engineering, or a related field. Knowledge of medical statistics and experience analysing large datasets, experience in bioinformatics and/or health data sciences and experience in the programming of R packages are essential. Experience in propensity scores, overlap weighting, inverse probability weighting and/or similar methods, expertise in pharmacoe or vaccine epidemiology and experience of working with electronic medical records/routinely collected data are desirable.

This is a full-time fixed-term appointment for 2 years.

The closing date for this position is 12 noon on 10 May 2024. You will be required to upload a CV and supporting statement as part of your online application.

Contact Person: HR Team, NOORMS
Contact Phone:
Pay Scale: STANDARD GRADE 6
Salary (£): £32,332 - £38,205 p.a
Vacancy ID: L72318
Closing Date & Time: 10-May-2024 12:00
Contact Email: hr@ndorms.ox.ac.uk

Opening: Research Assistant, University of Oxford
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?
May 14: 10-Minute Tutorials

Martí Català Sabaté
Medical Statistician/Data Scientist
University of Oxford

Kim López Güell
Dphil Student
University of Oxford

Maarten van Kessel
Software Developer
Erasmus MC

Louisa Smith
Assistant Professor
Northeastern University

Drug Utilization
Cohort Survival
Treatment Patterns
All of Us Research
The weekly OHDSI community call is held every Tuesday at 11 am ET.

Everybody is invited!

Links are sent out weekly and available at: ohdssi.org/community-calls