Extracting OHDSI Concepts from Clinical Narratives for COVID

OHDSI Community Call
Jan. 25, 2022 • 11 am ET
## Future OHDSI Community Calls

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Three Stages of The Journey

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

Congratulations to co-authors ChulHyoung Park, Seng Chan You, Hokyun Jeon, Chang Won Jeong, Jin Wook Choi, and Rae Woong Park on the study “Development and Validation of the Radiology Common Data Model (R-CDM) for the International Standardization of Medical Imaging Data” which was recently published in the Yonsei Medical Journal.
Congratulations to co-authors Xiangmin Ji, Guimei Cui, Chengzhen Xu, Jie Hou, Yunfei Zhang, and Yan Ren on the study “Combining a Pharmacological Network Model with a Bayesian Signal Detection Algorithm to Improve the Detection of Adverse Drug Events” which was recently published in Frontiers of Pharmacology.

Combining a Pharmacological Network Model with a Bayesian Signal Detection Algorithm to Improve the Detection of Adverse Drug Events

Xiangmin Ji, Guimei Cui, Chengzhen Xu, Jie Hou, Yunfei Zhang, and Yan Ren

School of Information Engineering, Anhui Institute of Science and Technology, Huangshan, China; School of Computer Science and Technology, Hubei Normal University, Huangshi, China; College of Intelligent Science and Engineering, Hubei Engineering University, Huangshi, China; Department of Mathematics and Computer Engineering, Union Institute of Technology, Cincinnati, Ohio.

Introduction: Improving adverse drug event (ADE) detection is important for post-marketing drug safety surveillance. Existing statistical approaches can be further optimized owing to their high efficiency and low cost.

Objective: The objective of this study was to evaluate the proposed approach for use in pharmacovigilance, the early detection of potential AUS, and the improvement of drug safety.

Methods: We developed a novel integrated approach, the Bayesian signal detection algorithm, based on the pharmacological network model (INN) using the FDA-Adverse Event Reporting System (FAERS) data published from 2004 to 2009 and from 2014 to 2019, PubChem, and DrugBank databases. First, we used a pharmacological network model to generate the probabilities for drug-ADE associations, which comprised the prior information component (PI). We then defined the probability of the propensly score adjustment based on a logistic regression model to control for the confounding bias. Finally, we chose the receiver operating characteristic (ROC) and the Observational Medical Outcomes Partnership (OMOP) data to evaluate the detection performance and robustness of the INN compared with the statistical approaches (disproportionality analysis (DPA) using the area under the receiver operator characteristics curve (AUC) and Youden’s index).

Results: Of the statistical approaches implemented, the INN showed the best performance (AUC 0.6299; Youden’s index 0.5000). Meanwhile, the AUCs of the IN and INN were 0.7345, 0.7391, and 0.6608, and 0.6721, respectively.

Conclusion: The proposed INN combined the strengths of the pharmacological network model and the Bayesian signal detection algorithm and performed better in detecting true drug-ADE associations. It also detected fewer ADE signals than a DPA and may be complementary to the existing statistical approaches.

Keywords: adverse drug events, pharmacological network model, signal detection algorithm, FDA adverse event reporting system, pharmacovigilance
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

<table>
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<tr>
<th>Date</th>
<th>Time (ET)</th>
<th>Meeting</th>
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<tr>
<td>Tuesday</td>
<td>12 pm</td>
<td>Common Data Model — Vocabulary Subgroup</td>
</tr>
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<td>Tuesday</td>
<td>2 pm</td>
<td>Health Equity</td>
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<tr>
<td>Wednesday</td>
<td>7 am</td>
<td>Medical Imaging</td>
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<td>Wednesday</td>
<td>10 am</td>
<td>Data Quality Dashboard</td>
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<td>Wednesday</td>
<td>11:30 am</td>
<td>Latin America</td>
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<tr>
<td>Wednesday</td>
<td>12 pm</td>
<td>FHIR and OMOP Terminologies Subgroup</td>
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<tr>
<td>Thursday</td>
<td>10 am</td>
<td>Medical Devices</td>
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<td>Friday</td>
<td>10 am</td>
<td>Phenotype Development and Evaluation</td>
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<td>Monday</td>
<td>10 am</td>
<td>Healthcare Systems (formerly EHR)</td>
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<td>Monday</td>
<td>10 am</td>
<td>GIS-Geographic Information System</td>
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<tr>
<td>Tuesday</td>
<td>10 am</td>
<td>Common Data Model</td>
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[www.ohdsi.org/upcoming-working-group-calls](www.ohdsi.org/upcoming-working-group-calls)
Welcome to OHDSI!

The Observational Health Data Sciences and Informatics (OHDSI) program is a multi-stakeholder, interdisciplinary collaborative to bring out the value of health data through large-scale analytics. All our solutions are open-source.

OHDSI has established an international network of researchers and observational health

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2021 OHDSI Symposium

The 2021 OHDSI Global Symposium featured plenary presentations on OHDSI’s Impact on the COVID-19 Pandemic, as well as on the Journey to Reliable Evidence. The main days included the State of the Community Presentation, the Collaborator Showcase, and a memorable Closing Ceremony that focused on OHDSI’s work through the perspective of a patient.

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5. Select the workgroups you want to join (you can refer to the WIKI for work group objectives


- XTLAS
- Clinical Trials
- Common Data Model
- Data Quality Dashboard Development
- Early-stage Researchers
- Education Work Group
- Electronic Health Record (EHR) ETL
- Geographic Information System (GIS)
- HADES Health Analytics Data-to-Evidence Suite
- Health Equity
- Latin America
- Medical Devices
- Natural Language Processing
- OHDSI APAC
- OHDSI APAC Steering Committee
- OHDSI Steering Committee
- Oncology
- Patient-Generated Health Data
- Pharmacovigilance Evidence Investigation
- Phenotype Development and Evaluation
- Population-Level Effect Estimation / Patient-Level Prediction
- Psychiatry
- Registry (formerly UK Biobank)
- Surgery and Perioperative Medicine
- Vaccine Safety
- Vaccine Vocabulary
- Women of OHDSI

6. Select the chapter(s) you want to join

- Africa
- Australia
- China
- Europe
- Japan
- Korea
- Singapore
- Taiwan

7. Select the studies you want to join

- HIPAA-Health Equity Research Assessment
- PIVOT3R BPA Prostate Cancer (study is close ended)
- SCRUL (SARS-CoV-2 large-scale longitudinal Analytics)
Get Access To Different Teams/WGs/Chapters

Welcome to OHDSI!

2021 OHDSI Symposium

The Observational Health Data Sciences and Informatics (OHDSI) program is a multi-stakeholder collaborative to bring together large-scale analytics in an open-source manner. OHDSI has created a new workgroup to encourage active collaboration within the community. Within the OHDSI organization, there are specific teams for work groups, chapters, and study. As well as OHDSI community activities such as the OHDSI Summer Symposium, all teams and open to all collaborations. Below is a list of workgroups which you would like to join and the OHDSI coordinating center team will grant access.

5. Select the workgroups you want to join (you can refer to the Wiki for work group objectives www.ohdsi.org/web/wiki/doku.php?id=projects:overview)

- ATLAS
- Clinical Trials
- Common Data Model
- Data Quality Dashboard Development
- Early-stage Researchers
- Education Work Group
- Electronic Health Record (EHR) ETL
- Geographic Information System (GIS)
- HADES Health Analytics Data-to-Evidence Suite
- Health Equity
- Latin America
- Medical Devices
- Natural Language Processing
- OHDSI APAC
- OHDSI APAC Steering Committee
- OHDSI Steering Committee
- Oncology
- Patient-Generated Health Data
- Pharmacovigilance Evidence Investigation

6. Select the chapter(s) you want to join

- Africa
- Australia
- China
- Europe
- Japan
- Korea
- Singapore
- Taiwan

7. Select the studies you want to join

- HEGS Health Equity Research Assessment
- PREDONE for Prostate Cancer (study ended)
- SCYLLA (SARS-Cov-2 Large-scale Longitudinal Analysis)
New Workgroups Page on OHDSI.org

OHDSI Workgroups

OHDSI’s central mission is to improve health by empowering a community to collaboratively generate the evidence that promotes better health decisions and better care. We work towards that goal in the areas of data standards, methodological research, open-source analytics development, and clinical applications.

Our workgroups present opportunities for all community members to find a home for their talents and passions, and make meaningful contributions. We are always looking for new collaborators. Learn more about these workgroups by checking out this page. Any workgroup that provided a community call update is highlighted in the top section.

See an area where you want to contribute? Please Join The Journey!

Join Our Workgroup Efforts!

Get To Know The OHDSI Workgroups

Clinical Trials
Current Participants: 166
Lead: Mike Hanley, Li Zhen

Common Data Model
Current Participants: 118
Lead: C. Pickard

Data Quality Dashboard Development
Current Participants: 19
Lead: Geir Eide

Early-Stage Researchers
Current Participants: 119
Lead: Stephen Winder, Meghan Morig

OHDSI Social Media
Current Participants: 16
Lead: Philipp Feiler

Pharmacovigilance Evidence (PAEC)
Current Participants: 126
Lead: John Waechter, Chi-Woong Kim

Patient-Level Prediction
Current Participants: 19
Lead: James Paz, Patrick Robnik

Phenotype Development & Evaluation
Current Participants: 16
Lead: Elizabeth Garfield

Population-Level Estimation
Current Participants: 10
Lead: Martin Schmaus, Ravi Suri

Psychiatry
Current Participants: 21
Lead: Oliver Dyrbye, Andrew Williams

Regulatory (formerly UK Biobank)
Current Participants: 10
Lead: Marni Nomell

Vaccine Vocabulary
Current Participants: 119
Lead: Margaret Gormley

Women of OHDSI
Current Participants: 119
Lead: Lise Asmussen

Education
Current Participants: 112
Lead: Nigel Hughes

Geographic Information System (GIS)
Current Participants: 136
Lead: Robert Miles, Andrew Williams

HADIS (Health Analytics Data-Link-Evidence Suite)
Current Participants: 136
Lead: Maarten Schure

Health Equity
Current Participants: 16
Lead: Jan Gillberg

Healthcare Systems (formerly EMHR)
Current Participants: 129
Lead: Bess Hsiao

Latin America
Current Participants: 10
Lead: Jorge Recio

Medical Devices
Current Participants: 10
Lead: Robert House, Angeli

Natural Language Processing
Current Participants: 16
Lead: Liz Yu

OHDSI Asia-Pacific
(AAPC)
Current Participants: 126
Lead: Xiaoxin Xu

Oncology
Current Participants: 10
Lead: Albert Schlagel

Pharmacovigilance Evidence (Investigation)
Current Participants: 10
Lead: Rob Ryan, Nina von Wyl

Population-Level Estimation
Current Participants: 10
Lead: Martin Schmaus, Ravi Suri

Patient-Level Prediction
Current Participants: 10
Lead: James Paz, Patrick Robnik

Phenotype Development & Evaluation
Current Participants: 10
Lead: Elizabeth Garfield

Psychiatry
Current Participants: 10
Lead: Oliver Dyrbye, Andrew Williams

Regulatory (formerly UK Biobank)
Current Participants: 10
Lead: Marni Nomell

Vaccine Vocabulary
Current Participants: 10
Lead: Margaret Gormley

Women of OHDSI
Current Participants: 10
Lead: Lise Asmussen

ohdsi.org/ohdsi-workgroups
Next APAC Call: Jan. 26, 10 pm ET

OHDSI APAC - Our Asia-Pacific Community

OHDSI is a global, multi-stakeholder, interdisciplinary and open-science network that collaborates to bring out the value of health data through large-scale analytics. Our Asia-Pacific (APAC) community comprises six regional chapters (Australia, China, Japan, Singapore, South Korea, Taiwan) and has led important OHDSI initiatives around the world.

The 2021 OHDSI Symposium was held Nov. 18, 2021, and featured a set of morning presentations, which are available to the right. These presentations focused on the State of the Global and APAC Community, the EHDEN Consortium and the PHIR/OhDSI collaboration.

The afternoon featured several collaborative activities, including study sessions, workgroup meetings and a collaborator showcase.
EHDEN 3-Year Report

Building on success: EHDEN completes its first three years!

17th January 2022

www.ehden.eu/ehden-enters-its-fourth-year
New Dates For The 2022 European Symposium

EUROPEAN OHDSI
SYMPOSIUM

Symposium: June 24th
Workshops: 25-26th

“All aboard!”
New Date!!

We’ll meet again for one journey ahead

www.ohdsi-europe.org/symposium-2022
Openings!

2022 Observational Health Data Analytics Internship Program

Location: Titusville, New Jersey; Raritan, New Jersey; Horsham, Pennsylvania
Category: General Administration
Req ID: 2105993940W

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Job Description

At Johnson & Johnson, we use technology and the power of collaboration to discover new ways to prevent and overcome the world's most significant healthcare challenges. Our Corporate, Consumer Health, Medical Devices, and Pharmaceutical teams leverage data, real-world insights, and creative minds to make life-changing healthcare products and medicines. We're disrupting outdated healthcare ecosystems and infusing them with transformative ideas to help people thrive throughout every stage of their lives. With a reach of more than a billion people every day, there's no limit to the impact you can make here. Are you ready to reimagine healthcare?

Here, your career breakthroughs will change the future of health, in all the best ways. And you'll change, too. You'll be inspired, and you'll inspire people across the world to change how they care for themselves and those they love. Amplify your impact. Join us!

Janssen R&D Epidemiology is hiring an undergraduate or graduate level summer, intern. Location: Remote or In-person (Raritan, NJ; Titusville, NJ; Horsham, PA)

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@OHDSI ohdsi
# OHDSI Social Showcase This Week

**The VISIT_DETAIL: A Vehicle for Standard Visits**

**Author:** Clair Blacketer

**METHODS:**
1. Optum Clininformatics Data Mart (OPD) is derived from a database of US administrative claims. The tables contain fine-grained details of patient encounters, including diagnoses, procedures, and the 3DM place of service code for where the encounter occurred.
2. The VISIT_DETAIL table is populated by creating a single record for each distinct place of service and visit type. The Place of Service mapped to a standard concept housed in the VISIT_DETAIL, CONCEPT, 21 field.
3. The VISIT_DETAIL table is then mapped to its term of interest in the 3DM (which is not a standard term) and a standard algorithm is then applied to identify unique visits.

**RESULTS:**
- There are 40 unique VISIT_DETAIL, CONCEPT 21s present in the Optum VISIT DETAIL table.
- After applying the standard concept lookup, the 40 concepts map to 10 terminal visit concepts.

**MONDAY**

**The VISITDETAIL: A Vehicle for Standard Visits**

**Author:** Clair Blacketer
Leveraging \textsc{APHRODITE} to identify bias in statistical phenotyping algorithms

\textsc{Lightning Talk!}

\textbf{Authors:} Juan M. Banda (presenter), Nigam H. Shah, Vyjeyanthi S Periyakoil

\textbf{Tuesday}

Our initial evaluation elucidates that the selected phenotype algorithms have performance (precision, recall, accuracy) variations anywhere between 3\% to 30\% across ethnic populations; even when not using ethnicity as a feature. Demonstrating how important it is to assess these models' performance before deploying them in routine use.
From type 2 diabetes diagnosis to developing complications: a multi-country approach to understanding patients' journey

Authors: David Vizcaya, George Argyriou, Jingsong Cui, Sarah Seager, Henry Morgan-Stewart, Christian Reich
Distributed Counterfactual Modeling Approach for Investigating Hospital-Associated Racial Disparities in COVID-19 Mortality

Authors: Mackenzie Edmondson, Chongliang Luo, Nazmul Islam, David Asch, Jiang Bian, Yong Chen

THURSDAY
Design of a framework to detect temporal clinical event trajectories from health data standardized to the OMOP CDM

**Authors:** Kadri Kunnapuu, Solomon Ioannou, Kadri Ligi, Raivo Kolde, Sven Laur, Jaak Vilo, Peter Rijnbeek, Sulev Reisberg

**FRAMEWORK DESCRIPTION**

1. Define a study cohort by using OMOP tools.
2. Specify study parameters:
   - Design type of events to include: conditions, drug exposures, procedures, observations, births, deaths, etc.
   - Use meaningful boundaries to standardize events.
   - Set size required for event pairs in the OMOP CDM
   - Set size range for transfer from OMOP to the study data.
3. Identify temporal clinical event pairs by: exhaustive statistical testing of all two-event sequences against the OMOP CDM vs data
   - For each event, look at the first occurrence if common times exist.
   - Break down individual patient
   - Event sequence for all possible two-event pairs.
   - For each event pair, compute an age-group reached current group and conduct statistical testing (Pearson test) to identify pairs whose events are correlated.
4. Use a result, a list of event pairs having significant temporal order and relative risk different from 1.0 is obtained.
   - Build trajectories from significant directional clinical event pairs.

**RESULTS**

**DESIGN OF A FRAMEWORK TO DETECT TEMPORAL CLINICAL EVENT TRAJECTORIES FROM HEALTH DATA STANDARDIZED TO THE OMOP CDM**

**Authors:** Kadri Kunnapuu, Solomon Ioannou, Kadri Ligi, Raivo Kolde, Sven Laur, Jaak Vilo, Peter Rijnbeek, Sulev Reisberg

**FRIDAY**
Where Are We Going?

Any other announcements of upcoming work, events, deadlines, etc?
Welcome To OHDSI Newcomers

Are there any people new to the OHDSI community call who would like to introduce themselves?

Please raise your hand, and we will call on three people.
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January 25 OHDSI Community Call

Extracting OHDSI Concepts from Clinical Narratives for COVID

Dr. Hongfang Liu
Professor of Biomedical Informatics, Mayo Clinic

Dr. Christopher G. Chute
Bloomberg Distinguished Professor of Health Informatics; Professor of Medicine, Internal Medicine, Johns Hopkins University