10-Minute Tutorials

OHDSI Community Call
Nov. 22, 2022 • 11 am ET
## Upcoming OHDSI Community Calls

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Three Stages of The Journey

Where Have We Been?
Where Are We Now?
Where Are We Going?
An ETL-process design for data harmonization to participate in international research with German real-world data based on FHIR and OMOP CDM

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A R T I C L E  I N F O

Keywords: FHIR, OMOP CDM, Data Harmonization, ETL

A B S T R A C T

Background: International studies are increasingly needed in order to gain more unbiased evidence from real-world data. To achieve this goal, across the European Union, the EU set up the SARIES EU project based on OMOP CDM mandated by the OHDSI community. The harmonization of heterogeneous real-world data in OMOP CDM adds an essential step to participant's research networks. Using the widespread communication standard HXL (a FHIR extension), we introduce the concept of the harmonization process in OMOP CDM. Enabling German academic hospitals to participate in such networks requires an efficient, transferable and reusable ETL process that meets the following criteria: (1) transforming heterogeneous patient data from HXL to OMOP CDM, (2) preserving huge amounts of data as one and (3) flexibility to cope with changes in FHIR profile. This article describes the development of an ETL process that automatically translates heterogeneous patient data from HXL to OMOP CDM in an intermediate data model. This ETL process is a valuable asset for German academic hospitals to participate in international research networks.

1. Background

International studies are increasingly needed in order to gain more unbiased evidence from real-world data. This became especially obvious during the COVID-19 pandemic and the following global vaccination campaign. In this context, the European Medical Agency (EMA) decided to set up a "Time Out and Real World Interrogation Network (TOMOROW)" to improve evidence in patients in real-world scenarios and to address events of medications based on real-world data across the European Union. The necessary data model will be based on the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) [4] that is established by the Observational Health Data Sciences and Informatics (OHDSI) [3] community. OMOP CDM itself is increasingly used worldwide [5, 6], which increases the chance of success of an international network.

For healthcare providers, participation in such networks requires a transfer of real-world data in the OMOP CDM. Due to the homogeneity of local health information systems, this is a crucial task. Using a wide range of communication standards, data can be translated to the complexity of such a task. For this, the Health Level 7 (HL7) [7] provides a Fast Healthcare Interoperability Resources (FHIR) format that enables the exchange of patient Electronic Health Record (EHR) data. As the acceptance of FHIR is
Congratulations to the team of **Yerim Kim, Seung In Seo, Kyung Joo Lee, Jinseob Kim, Jong Jin Yoo, Won-Woo Seo, Hyung Seok Lee, Woon Geon Shin** on the publication of **Long-term use of proton-pump inhibitor on Alzheimer's disease: a real-world distributed network analysis of six observational Korean databases using a Common Data Model** in *Therapeutic Advances in Neurological Disorders*.

**Background:** Dementia has a crucial impact on the quality of life of elderly patients and their caregivers. Proton-pump inhibitors (PPIs) are the most frequently prescribed treatment, but they have been shown to be associated with dementia. The data are inconsistent, however.

**Objective:** To investigate the association between PPIs use and Alzheimer’s disease (AD) or all-cause dementia in six observational Korean databases using a Common Data Model (CDM) and to perform a distributed network analysis.

**Methods:** Subjects aged over 18 years between 1 January 2004 and 31 December 2020. Among 7,293,565 subjects from 6 cohorts, 41,670 patients met the eligibility criteria. A total of 2,206 patients who were included in both cohorts or with a history of dementia were excluded. After propensity matching, 5699 propensity-matched pairs between the PPIs and histamine-2 receptor antagonist (H2-RA) users were included in this study. The primary outcome was the incidence of AD at least 365 days after drug exposure. The secondary outcome was the incidence of all-cause dementia at least 365 days after drug exposure.

**Results:** In the 1:1 propensity score matching, the risk of AD or all-cause dementia was not significantly different between the PPIs and H2-RA groups in all six databases. In the distributed network analysis, the long-term PPI users (≥365 days) were unassociated with AD [hazard ratio (HR) = 0.92, 95% confidence interval (CI) = 0.68–1.23; \( \hat{r} = 0\% \)] and all-cause dementia (HR = 1.04, 95% CI = 0.82–1.31; \( \hat{r} = 0\% \)) compared with H2RA users.

**Conclusion:** In the distributed network analysis of six Korean hospital databases using Observational Medical Outcomes Partnership (OMOP)-CDM data, the long-term use of PPI was not associated with a statistically significantly increased risk of AD or all-cause dementia. Therefore, we suggest that physicians should not avoid these medications because of concern about dementia risk.
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?
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Where Are We Going?
# Upcoming Workgroup Calls

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<td>Common Data Model Vocabulary Subgroup</td>
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<td>Tuesday</td>
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<td>OMOP CDM Oncology Outreach/Research Subgroup</td>
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<td>Wednesday</td>
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<td>FHIR and OMOP Digital Quality Measurements Subgroup (ZOOM)</td>
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[ohdsi.org/upcoming-working-group-calls/](https://www.ohdsi.org/upcoming-working-group-calls/)
Please join the Nov. 23 Open-Source Community WG meeting, which will include a presentation from 2018 Titan Award winner Lee Evans focused on OHDSI open source software: continuous integration, automated testing, & test database infrastructure.
Join Anna Ostropolets’ Dissertation Defense

OHDSI veteran and 2018 Titan Award winner Anna Ostropolets will defend her Columbia University dissertation Wed., Nov. 30, on Generating Reliable and Responsive Observational Evidence: Reducing Pre-analysis Bias. The open session will be at 10 am ET on Zoom.

Wednesday, Nov. 30, 10 am ET
Patrick Ryan shared a recent forum post called “Introducing the OMOP CDM ER Diagram Challenge” and is calling for community submissions by Tuesday, Dec. 13.

The winner will be announced at the Dec. 20 community call!
The elderly and female asthma patients get the most prescriptions of potentially harmful drugs, strongly predicted by age and the \( \text{CHA}_2\text{DS}_2\text{-VASc} \) score.
Development of the Medical Imaging Extension for OMOP-CDM

(Briana Malik, Kyulee Jeon, Tarik Alkasab, Pedro Mallol, Seng Chan You, Paul Nagy)

We aim to harmonize and standardize information for medical images to overcome current challenges in interoperability and reproducibility in medical image research. From pixels to Phenotypes.

TUESDAY
A survey of OMOP CDM-compatible visualization tools & what the community may do to support tool development and adoption (Natthawut Adulyanukosol, David Gotz)
Northeastern University invites applications for multiple tenured/tenure-track faculty positions in support of an Impact Engine centered on large-scale observational health data science and informatics to start in the fall of 2023. These faculty will be core members of our Real-World Healthcare Navigator (RWHN) Impact Engine which aims to change how research is translated into clinical practice by establishing a sustainable service that leads the way in fully reproducing health studies.
The OHDSI Center at the Roux Institute seeks a postdoctoral fellow to join their team focused on developing statistical methods and applying them to observational data from large-scale federated datasets (e.g. electronic health records and administrative claims data), with specific applications to the safety of biologics. This research will directly improve our ability to use real world data to characterize patient populations, construct population level estimates relating exposures to health outcomes, and to enhance clinical decision making through improved patient-level predictions.
Opening: FDA/CDER

FDA/CDER’s Division of Hepatology and Nutrition is seeking a clinician with bioinformatics or biostatistics training to work with the Drug-Induced Liver Injury (DILI) Team to evaluate large datasets of liver-related data, collaborate on the Team’s review of drugs with hepatotoxicity signals, and help develop informatics-based processes in DILI evaluation across the Agency.

Contact Judy Racoosin at judith.racoosin@fda.hhs.gov for information about the application process (that will be through USAJOBS).
Andrew Williams recently announced two exciting new openings at Tufts Medicine.

1) Senior Project Manager for a multisite multiyear grant standardizing critical care EHR and waveform data. (CHoRUS Bridge2AI)

2) Lead software developer and research data warehouse manager for Tufts Medicine’s OMOP instance and related services.

Remote work is possible for both positions.

1. Link for Senior Project Manager position: https://smrtr.io/bBVzh
2. Link for Lead Software Developer and Research Data Warehouse Manager position: https://jobs.smartrecruiters.com/TuftsMedicalCenter1/743999857980631-software-development-lead-res-g-c-ctsi

Andrew’s email: awilliams15@tuftsmedicalcenter.org
Openings: Johns Hopkins University

Research Associate (Data Scientist/Statistical Engineer), Johns Hopkins inHealth and Biostatistics Center

- Execute OHDSI studies (e.g. for cohort characterizations and comparative effectiveness) on Johns Hopkins’s EHR data to support clinicians;
- Collaborate with statisticians and clinicians to continuously integrate state-of-the-art statistical tools to the inHealth/OHDSI tool stack for deployment;
- Mentor trainees on data science and software development skills;
- Co-teach courses on observational health data analytics and data science skills at School of Medicine and Public Health;
- Facilitate adoption of the inHealth tools among the broader OHDSI community by contributing to OHDSI’s Health Analytics Data-to-Evidence Suite.

- https://apply.interfolio.com/114436
Where Are We Going?

Any other announcements of upcoming work, events, deadlines, etc?
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PHOEBE 2.0
Anna Ostropolets
PhD Student, Columbia University

Automated Comparator Selection
Justin Bohn
Associate Director, Epidemiology at Janssen

Strategus
Anthony Sena
Associate Director, Observational Health Data Analytics at Janssen

Einstein-ATLAS
Selvin Soby
Director, Informatics & Data Analytics at Montefiore

Broadsea
Lee Evans
Founder, LTS Computing LLC