



# Workgroup Spotlight: Eye Care & Visions Research and Rehabilitation

**OHDSI Community Call**  
**Aug. 18, 2026 • 11 am ET**



# Upcoming Community Calls

| Date     | Topic                                                            |
|----------|------------------------------------------------------------------|
| Aug. 18  | Workgroup Spotlight: Eyecare and Vision Research, Rehabilitation |
| Aug. 25  | Asia-Pacific Regional Updates                                    |
| Sept. 1  | Vocabulary Refresh, Summer 2026 Version                          |
| Sept. 8  | Medical Imaging Workgroup Spotlight, CDM 5.5 Review              |
| Sept. 15 | Global Symposium Preview                                         |
| Sept. 22 | TBA                                                              |
| Sept. 29 | OHDSI/OMOP Research Spotlight                                    |



# Three Stages of The Journey

**Where Have We Been?**

**Where Are We Now?**

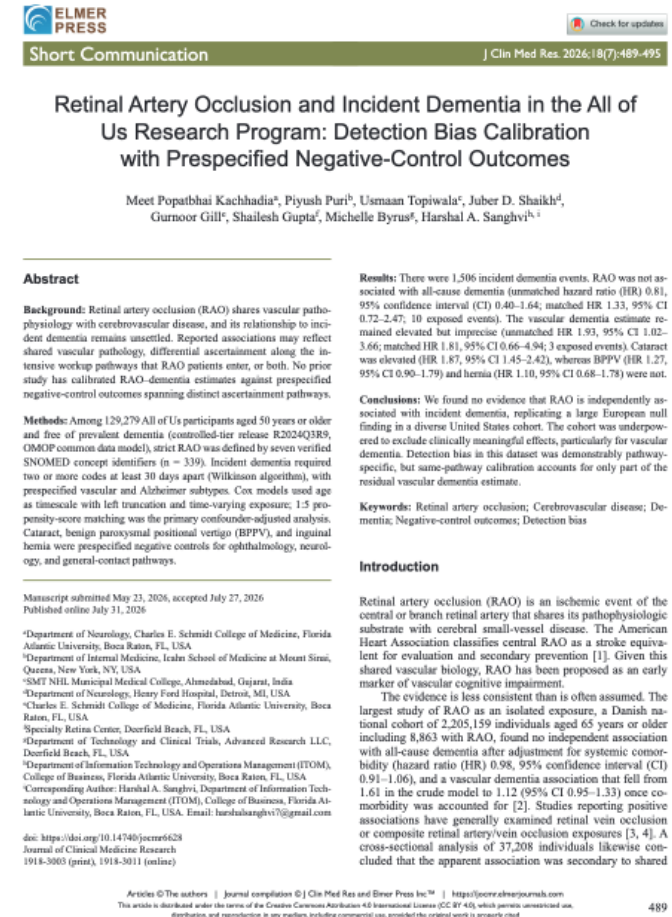
**Where Are We Going?**



# OHDSI Shoutouts!



Congratulations to the team of **Meet Popatbhai Kachhadia, Piyush Puri, Usmaan Topiwala, Juber D Shaikh, Gurnoor Gill, Shailesh Gupta, Michelle Byrus, and Harshal A Sanghvi** on the recent publication of **Retinal Artery Occlusion and Incident Dementia in the All of Us Research Program: Detection Bias Calibration with Prespecified Negative-Control Outcomes** in the *Journal of Clinical Medicine Research*.



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# OHDSI Shoutouts!



Congratulations to the team of **Syedmostafa Sheikhalishahi, Mathias Kaspar, Johanna Schwinn, Matthaeus Morhart, Philipp Simon, and Ludwig Christian Hinske** on the recent publication of **Cross-Silo Federated Learning for Predicting Successful Mechanical Ventilation Weaning Across 5 Intensive Care Unit Databases: Retrospective Database Analysis in *JMIR Medical Informatics*.**

JMIR MEDICAL INFORMATICS

Sheikhalishahi et al

Original Paper

## Cross-Silo Federated Learning for Predicting Successful Mechanical Ventilation Weaning Across 5 Intensive Care Unit Databases: Retrospective Database Analysis

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### Abstract

**Background:** The prediction of weaning from mechanical ventilation (MV) can support clinical decision-making and help reduce the risk of weaning failure in intensive care units (ICUs). Cross-silo federated learning (FL) offers a promising approach to developing robust predictive models across multiple institutions without requiring the sharing of patient-level data.

**Objective:** This study aimed to evaluate the feasibility and efficacy of FL for predicting successful weaning from MV across 5 diverse ICU databases and to compare its performance with local learning (LL) and centralized learning (CL) approaches that differ in their data-sharing requirements.

**Methods:** We conducted a retrospective analysis using 5 ICU databases, namely the eICU Collaborative Research Database (eICU-CRD), Medical Information Mart for Intensive Care IV (MIMIC-IV), Universitätsklinikum Augsburg (UKA), High-Resolution ICU Dataset (HiRID), and Amsterdam University Medical Centers (AUMC), transforming clinical variables into the Observational Medical Outcomes Partnership (OMOP) Common Data Model. We defined successful weaning as a sustained reduction in positive end-expiratory pressure. We compared 3 learning approaches, FL, LL, and CL, using extreme gradient boosting (XGBoost). Performance was evaluated using the area under the receiver operating characteristic curve (AUROC), area under the precision-recall curve (AUPRC), precision, recall, and  $F_1$ -score. All data use complied with local ethical regulations and institutional review board approvals, and all databases contained deidentified patient data accessed under institutional data use agreements and governed by applicable privacy regulations.

**Results:** A total of 24,521 patients were included across 5 databases. The CL model achieved an AUROC of 0.81, AUPRC of 0.57, and  $F_1$ -score of 0.54 on pooled test data. The FL model achieved a macroaveraged AUROC of 0.74, AUPRC of 0.56, and  $F_1$ -score of 0.52. LL model performance varied across databases (AUROC=0.68-0.84, AUPRC=0.51-0.68,  $F_1$ -score=0.49-0.67), reflecting differences in data distribution and class balance.

**Conclusions:** Our findings highlight performance differences between learning approaches for MV weaning prediction. LL models achieved the highest performance within their respective institutions (AUROC=0.68-0.84), CL achieved the highest performance on pooled test data (AUROC=0.81), and FL showed lower but reasonable performance while avoiding direct sharing of patient-level data (AUROC=0.74). The choice between approaches depends on institutional data-sharing constraints, local dataset characteristics, and acceptable performance thresholds. As privacy was not formally measured, these findings should be read as a performance comparison rather than a privacy-performance trade-off.

(JMIR Med Inform 2026;14:e79713) doi: [10.2196/79713](https://doi.org/10.2196/79713)



# Three Stages of The Journey

**Where Have We Been?**

**Where Are We Now?**

**Where Are We Going?**



# Upcoming Workgroup Calls



| Date      | Time (ET) | Meeting                                  |
|-----------|-----------|------------------------------------------|
| Tuesday   | 12 pm     | CDM Vocabulary                           |
| Wednesday | 10 am     | Common Data Model                        |
| Wednesday | 7 pm      | Medical Imaging                          |
| Thursday  | 9 am      | Oncology Vocabulary/Development Subgroup |
| Thursday  | 10 am     | GIS-Geographic Information System        |
| Thursday  | 10:30 am  | Evidence Network                         |
| Thursday  | 12 pm     | HADES                                    |
| Thursday  | 7 pm      | Dentistry                                |
| Friday    | 9 am      | Waveform                                 |
| Friday    | 10 am     | Transplant                               |
| Friday    | 10:30 am  | Education                                |
| Friday    | 11:30 am  | Steering                                 |
| Tuesday   | 9 am      | Oncology Genomic Subgroup                |
| Tuesday   | 9 am      | Data2Evidence                            |
| Tuesday   | 9 am      | OpenEHR & OMOP                           |





# Titan Nominations Are OPEN!

The OHDSI Titan Awards recognize those who have gone above and beyond to foster community engagement, lead research and development efforts and make significant contributions towards OHDSI's mission.

Individuals, teams or collaborating institutions can be nominated for an award, and you can make as many nominations as you would like.

**Nominations will be accepted until 8pm ET  
Tuesday, Sept. 22, 2026.**

[ohdsi.org/titan-awards](https://ohdsi.org/titan-awards)



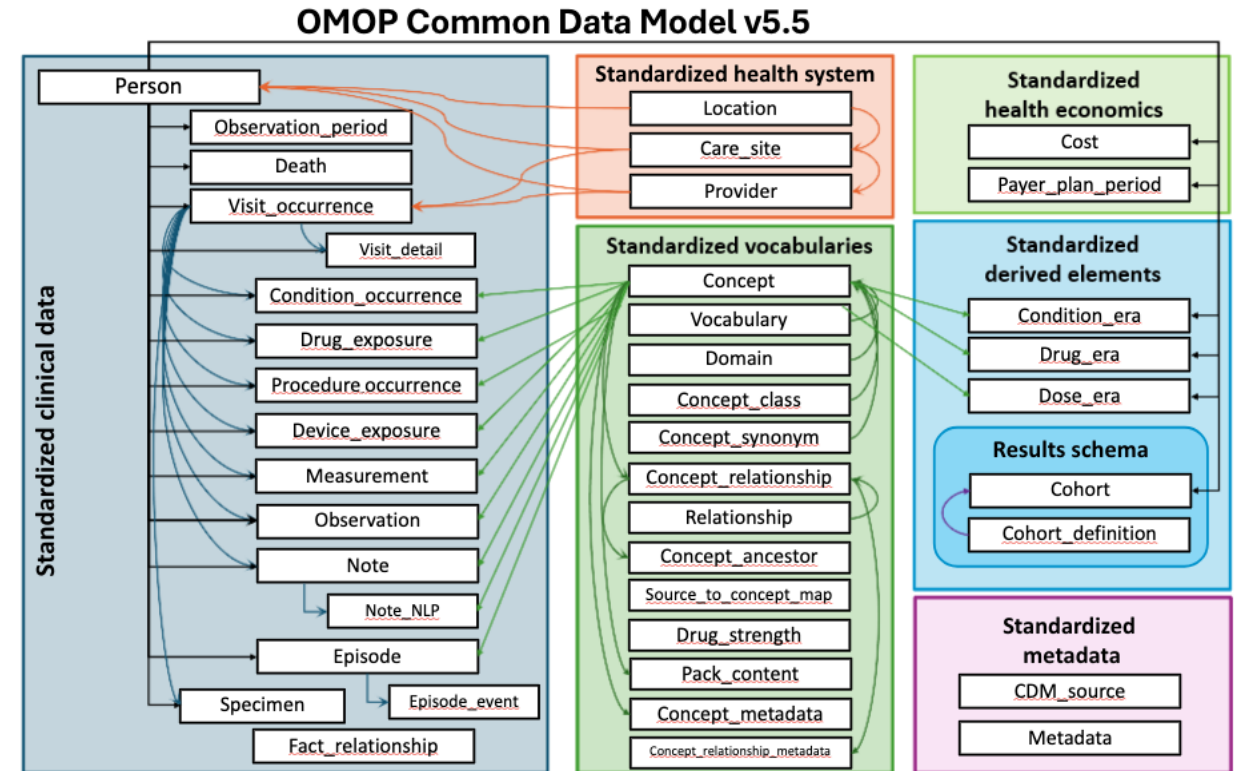




# Collaborate on OMOP CDM v5.5

The Common Data Model working group has been planning CDM v5.5 over the last 18 months and there is now a development version to share. Please take a look, review, and test in your environment if you are able.

This version will be released alongside the August 2026 vocabulary and will support community needs and continued vocabulary updates.



[github.com/OHDSI/CommonDataModel/tree/develop](https://github.com/OHDSI/CommonDataModel/tree/develop)



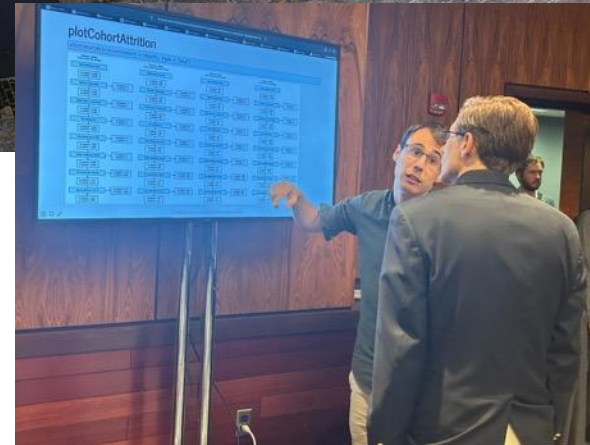
# 2026 OHDSI Global Symposium

Registration is OPEN for the **2026 OHDSI Global Symposium**, which will be held Oct. 20-22 in New Brunswick, N.J., USA.

**Oct. 20:** Tutorials

**Oct. 21:** Plenaries, Showcase

**Oct. 22:** Workgroup Activities



[ohdsi.org/OHDSI2026](https://ohdsi.org/OHDSI2026)



# 2026 Symposium Tutorials – Session 1

- **An Introduction to the Journey from Data to Evidence Using OHDSI**
- **An Introduction to ATLAS**
- **Bringing FAIR to Imaging Research with the Medical Imaging OMOP Extension**
- **Complex Phenotyping at Scale with and without LLMs Using PhenotypeR**
- **OHDSI Leadership Storytelling Workshop**
- **Mastering OMOP: Transforming EHR Data with Practical Strategies, Best Practices, and OHDSI Integration**



# 2026 Symposium Tutorials – Session 2

- **Building and Using the OHDSI Evidence Network: From Data Partner to Federated Study Execution**
- **From Multi-Modal Data to Real-World Evidence: Hands-on with the Data2Evidence Platform for OMOP Data Curation and Analytics**
- **Integrating Geospatial Data Into OMOP CDM**
- **Introduction to OHDSI Phenotype Development & Evaluation**
- **OHDSI Standardized Vocabularies on FHIR: A Deep Dive Using the Echidna Terminology Server**
- **Using OMOP Model in Registry Context & Clinical Trials Standardization Context: Conventions, Past Use Cases, SDTM & Regulatory Consideration, Challenges**





# 2026 Global Symposium Agenda

| Start    | End      | Topic                                                                                                            | Presenter/Lead            |
|----------|----------|------------------------------------------------------------------------------------------------------------------|---------------------------|
| 7:15 am  | 8:00 am  | Newcomer Welcome                                                                                                 | Paul Nagy/Marc Suchard    |
| 8:00 am  | 8:30 am  | State of the Community                                                                                           | George Hripcsak           |
| 8:30 am  | 9:15 am  | OHDSI Year In Review                                                                                             | Early-Stage Researcher WG |
| 9:15 am  | 10:00 am | Collaborator Showcase: Posters and Demos (Session 1)                                                             |                           |
| 10:00 am | 11:00 am | Plenary 1: Federated Learning Meets Negative Control Calibration: Toward Reliable Multi-Site Evidence Generation | Yong Chen                 |
| 11:00 am | 12:00 pm | Plenary 2: Beyond the Defaults: How the OHDSI Community is Adapting, Extending, and Reimagining Its Tools        | Scott Duvall              |
| 12:00 pm | 1:00 pm  | Network & Lunch                                                                                                  |                           |
| 1:00 pm  | 2:00 pm  | Plenary 3: The role of national initiatives in supporting sustainability, collaboration, and growth of OHDSI     | Ed Burn                   |
| 2:00 pm  | 2:45 pm  | Collaborator Showcase: Lightning Talks (Session 1)                                                               | 5 presenters              |
| 2:45 pm  | 3:30 pm  | Collaborator Showcase: Posters and Demos (Session 2)                                                             |                           |
| 3:30 pm  | 4:15 pm  | Collaborator Showcase: Posters and Demos (Session 3)                                                             |                           |
| 4:15 pm  | 5:00 pm  | Collaborator Showcase: Lightning Talks (Session 2)                                                               | 5 presenters              |
| 5:00 pm  | 6:00 pm  | Titan Awards, Closing                                                                                            | Patrick Ryan              |
| 6:00 pm  | 8:30 pm  | Dinner on your own                                                                                               |                           |
| 8:30 pm  | 11:30 pm | OHDSI Jam Session                                                                                                | Martijn Schuemie          |



# 2026 Symposium Workgroup Activities

**Session 1 (8 am – 10 am):** Eyecare and Vision Research, GIS – Geographic Information Systems, Early-Stage Researchers, Industry, Tidy R Programming with OMOP, HADES Hackathon, Generative AI and Foundation Models, Phenotype Development and Evaluation, Oncology, Health Equity, Vocabularies, APAC

**Session 2 (10:30 am – 12:30 pm):** Perinatal and Reproductive Health, Waveform, Medical Imaging, Industry, Tidy R Programming with OMOP, HADES Hackathon, Generative AI and Foundation Models, Phenotype Development and Evaluation, Oncology, Health Equity, Vocabularies, Rare Disease

**Session 3 (1:30 pm – 3:30 pm):** Dentistry, GIS & Waveform Cross-Pollination Meeting, Evidence Network, Women of OHDSI, Psychiatry, HADES Hackathon, Natural Language Processing, Health Economics & Value Assessment, ATLAS/WebAPI, CDM Survey, Surgery & Perioperative Medicine

**Session 4 (3:30 pm – 5 pm):** Workgroup Summary Session





# 2026 OHDSI Global Symposium

There are opportunities to be both a **sponsor** and an **exhibitor** at the Global Symposium.

Please reach out to [symposium@OHDSI.org](mailto:symposium@OHDSI.org) for more information.

[ohdsi.org/OHDSI2026](https://ohdsi.org/OHDSI2026)





The OMOP Practitioner

Data quality . Cohort design . Real-world evidence

Expert training . Rotterdam . September 7-9, 2026

OMOP CDM SCHEME

NEW

You've built your OMOP CDM. Now let's make it shine!

Take your OMOP implementation to the next level

- 2.5-day hands-on expert training (max. 30 participants)
- Work with Data Quality Dashboard, ATLAS, CohortDiagnostics
- Learn study design, validation, execution
- Optional: bring your own ETL + OMOP CDM

### What to expect

- Practical OMOP expertise
- Concrete CDM improvements
- Skills for evidence generation

### Practical

 7-9 September 2026  
 Rotterdam







# APAC Symposium: Nov. 13-15

The 2026 APAC Symposium will be held Nov. 13-15 at Yonsei University in Seoul, South Korea.

**Nov. 13:** Main Conference

**Nov. 14:** Tutorials, Datathon

**Nov. 15:** Datathon Team Activities

Registration will open soon, and the showcase submission deadline is August 23 at 10 pm ET.

[ohdsi.org/APAC2026](https://ohdsi.org/APAC2026)





# #OHDSISocialShowcase This Week

## Monday

# Hospital 12 de Octubre's Experience in Real-World Evidence Generation

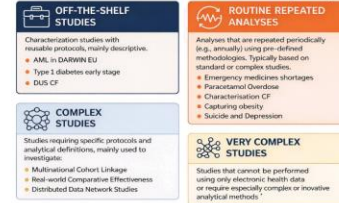
(**Paula Rubio Mayo**, Jaime Cruz Rojo, Gustavo Roig Domínguez, Julia Hernández Sánchez, Noelia García Barrio, Juan Luis Cruz Bermúdez)

A mature OMOP infrastructure at Hospital 12 de Octubre enables **regulatory-grade evidence** and participation in **European networks**

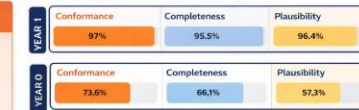
*Hospital 12 de Octubre's Experience in Real-World Evidence Generation*

**Background:** Hospital Universitario 12 de Octubre has built a strong strategy for data standardisation and structured clinical information. As a result, this has enabled the development of a high-quality OMOP-CDM data catalogue and more reliable real-world evidence. In turn, its mature data governance and interoperability have supported participation in DARWIN EU and other international initiatives. Therefore, this work describes that strategy, its data catalogue, and the lessons learned for other hospitals.

**Result 1:** Types of studies in which our team has participated

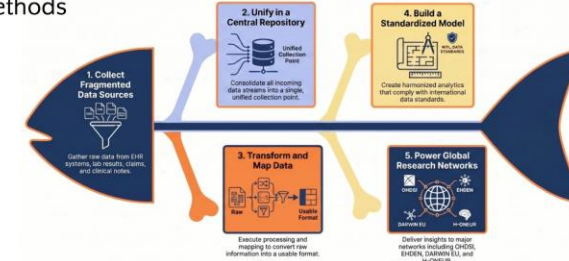


**Result 2:** Improvement in data quality over time



The methodology has enabled us to generate robust, reproducible evidence from fragmented healthcare data and to achieve the following results over time. Through a structured process of data harmonization, transformation, and quality assessment, we have improved the consistency, completeness, and plausibility of the information, while also expanding the range and complexity of studies.

**Methods**



**Limitations:** The main limitations identified were gaps in some data domains, particularly in oncology, as well as technical and infrastructural challenges related to ETL optimization and server capacity. These factors initially affected data completeness and analytical readiness, highlighting the need for continuous improvement in data integration and infrastructure.



Paula Rubio-Mayo, Jaime Cruz-Rojo, Gustavo Roig-Domínguez, Julia Hernández-Sánchez, Noelia García-Barrio, Juan Luis Cruz-Bermúdez,



# #OHDSISocialShowcase This Week

## Tuesday

# Detecting implausible measurement values in observational data using machine-learning based outlier detection methods

(Anthony G. Sena, Peter R. Rijnbeek, Aniek Markus)

Anomaly detection should depend on context: outliers differ by age and gender

Title: Detecting implausible measurement values in observational data using machine-learning based outlier detection methods

**Background:** Standardizing real-world data to the OMOP Common Data Model (CDM) enables systematic evaluation of data quality, with the OHDSI DataQualityDashboard (DQD) providing rule-based checks aligned to the Kahn et al. framework for conformance, completeness, and plausibility. However, these predefined checks may miss unexpected or context-specific anomalies in measurement data. In this study, we evaluate concept-level plausibility using both univariate and machine learning approaches using systolic blood pressure (SBP) as a representative clinical example. Univariate methods included Tukey fences (IQR-based), z-score, modified z-score (MAD-based), percentile-based thresholds, and robust standard deviation rules to identify extreme values across global distributions. In parallel, we applied two unsupervised machine learning methods: Isolation Forest (IF), which isolates anomalies using an ensemble of random trees such that anomalous observations require fewer splits to separate, and Gaussian Anomaly Detection (GAD), which models the data distribution and flags observations with low probability under the assumed distribution. Together, these approaches enable comparison of rule-based and data-driven methods for identifying implausible measurement values and augmenting existing rule-based data quality assessments.

Univariate methods converge on a consistent range for plausible systolic blood pressure values

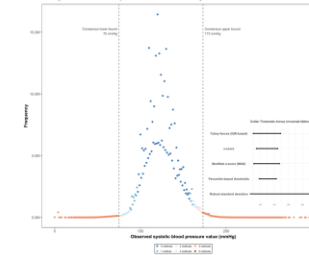


Figure 1: Distribution of systolic blood pressure values without outliers identified by five univariate methods. Values flagged by  $\geq 3$  methods define lower and upper bound for plausible measurements.

Outlier detection methods agree overall, but become more sensitive when stratified by age and gender

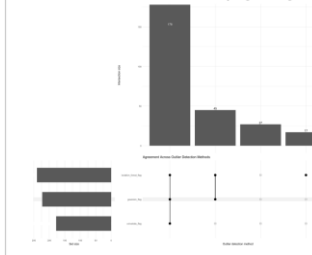


Figure 2: Scatter plot showing overlap of systolic blood pressure (SBP) values flagged as outliers by global univariate methods and stratified machine learning approaches (Isolation Forest and Gaussian Anomaly Detection). Set size bars indicate the total number of SBP values flagged by each method, while intersection bars represent the number of values identified by specific combinations of methods.

### Methods



**Future Work** will explore how AI-driven methods can be used to assess and improve data quality at scale across all measurement types and, ultimately, across all domains. We invite discussion on how these approaches can be integrated into the federated OHDSI networks.



Anthony G. Sena<sup>1,2</sup>, Peter R. Rijnbeek<sup>1</sup>, Aniek F. Markus<sup>1</sup>

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<sup>2</sup>Johnson & Johnson, Raritan, NJ, USA







# #OHDSISocialShowcase This Week

## Wednesday Lessons Learned from Implementing OMOP ETLs Across EHR and Registry- Based Data Sources

(**Renata Silva**, Sofia Gomes, Mariana Canelas-Pais, Ana Sá-Sousa, Tiago Taveira-Gomes)

### Lessons Learned from Implementing OMOP ETLs Across EHR and Registry-Based Data Sources

Renata Silva<sup>1</sup>, Sofia Gomes<sup>1</sup>, Mariana Canelas-Pais<sup>1,2,3</sup>, Ana Sá-Sousa<sup>1</sup>, Tiago Taveira-Gomes<sup>2,4</sup>

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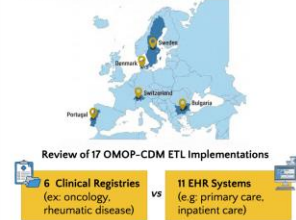
renata.silva@mtg-research.com

#### Background

Data diversity between Electronic Health Records (EHRs) and clinical registries is a major barrier to multi-center research<sup>1,2</sup>. ETL design is strongly influenced by the structural and semantic characteristics of the source system<sup>3</sup>.

This work compares ETL experiences across European EHRs and registries, to identify methodological challenges and support cross-border interoperability initiatives (e.g. European Health Data Space - EHDS).

#### Methods



#### Results

**Registry ETLs:** focuses on the structural reshaping of denormalized datasets and the reconstruction of implicit clinical meaning from disease-specific variables to resolve fragmented data lineage

**EHR ETLs:** prioritizes navigating complex normalized schemas and interpreting workflow-driven semantics to extract relevant clinical events from high-volume transactional data

Table 1. Comparative characteristics observed during OMOP CDM ETL development across registry-based and EHR-based clinical data sources

| Dimension                    | Registry                                              | EHR                                                        |
|------------------------------|-------------------------------------------------------|------------------------------------------------------------|
| Data Structure               | Wide, partially denormalized; JSON/XML attributes     | Normalized relational schemas across linked tables         |
| Vocabulary Availability      | No standardized vocabularies; source-derived mappings | Controlled vocabularies with reference tables              |
| SQL Transformation Patterns  | Unpivot, UNION ALL, GROUP BY                          | Multi-table JOINs and filtering (WHERE)                    |
| Data Lineage Traceability    | Fragmented lineage from manual curation               | Strong lineage via transactional models                    |
| Relational Consistency       | No referential integrity constraints;                 | Referential integrity enforced; Infrequent inconsistencies |
| Source Data Origin           | Periodic data extracts or reporting datasets          | Transactional clinical systems                             |
| Data Semantics Preservation  | Reconstruction of registry-specific semantics         | Workflow-driven data semantics                             |
| Access and Integration       | Structured data exports                               | APIs, DB connections, vendor-mediated extractions          |
| Temporal Data Representation | Simplified or aggregated time context                 | Reconstruction of clinical timelines                       |
| Historical System Evolution  | Variable additions and schema drift                   | System migration and legacy workflow logic                 |

CDM: Common Data Model; DB: Database; EHR: Electronic Health Record; OMOP: Observational Medical Outcomes Partnership.

#### Conclusion

To build scalable pipelines, OMOP-CDM ETL designs must be specifically tailored to the unique structural, semantic, and data-generation characteristics of each source system.



#### References

1. Dittmann V, Kharrat H, Lohmann H, Taylor GD. Clustering Data from Electronic Health Records [Internet]. Agency for Healthcare Research and Quality; 2019 [cited 2024 Feb 16]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK531876/>
2. Bendemann F, Ong A, Davidov A, Orlow A, Solovay P, Sun H, et al. Standardizing registry data to the OMOP Common Data Model: experience from three pulmonary hypertension registries. *BMC Med Res Methodol* [Internet]. 2021 Nov;21(1):234. Available from: <https://doi.org/10.1186/s12916-021-01434-3>
3. Pappas V, Morait M, Paynter S, Anselberg P, Lumbert ST, Homingway H, et al. Transforming and evaluating electronic health record disease phenotyping algorithms using the OMOP common data model: a case study in heart failure. *JAMIA Open* [Internet]. 2023 July;4(3):oaa001. Available from: <https://doi.org/10.1093/jamiaopen/oaad001>





# #OHDSISocialShowcase This Week

Thursday

## AI-Assisted Precision and Granularity Assessment of In-Source Japanese Diagnosis Mappings

(Tetiana Orlova, Mikita Salavei, Tatsiana Skuhareuskaya)

### AI-Assisted Precision and Granularity Assessment of In-Source Japanese Diagnosis Mappings

**Background:** Standardizing data from certain geographical regions, such as Japan, remains challenging despite their widespread representation. Current standardization efforts focus on high-concept drug mapping [1] and unified terminology representation, including the work of the Medical Information System (MEDIS) [2]. MEDIS distributions include vendor-provided mappings to ICD-10. However, we hypothesized a mismatch: MEDIS terms likely capture more granular clinical entities than ICD-10's broad classification categories can represent. This work lays the ground for further efforts in Japanese healthcare data standardization, with direct implications for improving Extract, Transform, Load (ETL) processes and enhancing the reliability of multi-national observational research.

**Methods:** We analyzed MEDIS source terms and their native ICD-10 mappings. We used English translation present in the source for all the analyses. To assess ICD-10 mapping precision, we applied a vectorizer-embedder algorithm with Euclidean distance measurement, previously developed and validated for regimen mappings to OHDSI vocabularies [3]. The algorithm generated mapping suggestions between source terms and ICD-10 codes, which Subject Matter Experts (SMEs) evaluated to identify suboptimal native mappings. SMEs were medical doctors with experience working with OHDSI vocabularies and their mappings.

To evaluate mapping granularity and its impact on clinical specificity, we compared two distinct mapping pathways. Pathway 1 (Direct mapping): SMEs manually mapped MEDIS source terms directly to SNOMED CT and other Standard OHDSI vocabularies, preserving the clinical granularity inherent in the source terminology. Pathway 2 (ICD-10-mediated mapping): We computationally mapped MEDIS terms through their native ICD-10 codes to Standard vocabularies using the OHDSI concept\_relationship table, simulating the current standard workflow. Our primary outcome metric quantified information loss: the proportion of mappings that resulted in broader (less specific) or more granular (more specific) Standard concepts in Pathway 2 relative to Pathway 1. This comparison directly measures whether the ICD-10 intermediate step introduces systematic loss of clinical specificity. Figure 1 presents a schematic overview illustrating all possible granularity outcomes assessed by this methodology. All analyses utilized OHDSI vocabularies version 5.0 (27-AUG-2025).

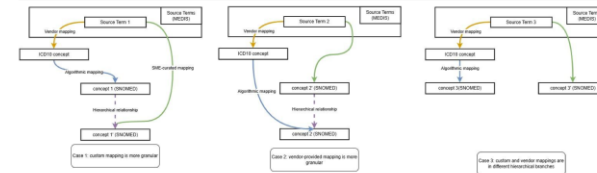


Figure 1 Possible outcomes of mapping granularity comparison

**Results:** Of 27,563 ICD-10 mappings evaluated, 8,420 (30.5%) aligned with Large Language Model (LLM) generated suggestions. For the 19,143 mappings that did not align, SMEs manually compared the native and LLM-generated mappings to assess mapping quality. We randomly selected 3,000 of these discordant mappings (15.7%) for human review.

**Results (cont.):** SME review found that 2,671 (89%) of the source mappings were optimal, while 329 (11%) were suboptimal. Applying this proportion to all discordant mappings suggests an overall suboptimal mapping rate of approximately 2.04% in the source vocabulary (Figure 2).

In the second phase, we compared the level of detail between the existing vendor mapping and an SME-developed mapping. We assessed whether each mapping used broader or more specific diagnostic codes by assessing their position within the hierarchy of OHDSI vocabularies. We found that 6,964 (25.3%) codes were mapped to a broader (more general) concept in the vendor mapping compared to the custom mapping, while 2,974 (10.8%) codes were mapped to a more specific concept in the vendor mapping (Figure 3). Overall, the vendor mapping more frequently favored broader, more general codes over specific ones.

**Discussion and conclusion:** Our hybrid computational-expert approach identified a low rate of technically suboptimal mappings (2.04%). However, examining semantic granularity revealed that over one-quarter of ICD-10-mediated mappings resulted in clinically broader concepts than the original MEDIS source terms, representing substantial information loss.

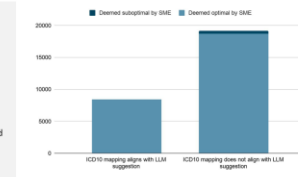


Figure 2 Proportions of vendor-provided mappings to ICD10 aligning with the LLM-suggested mappings

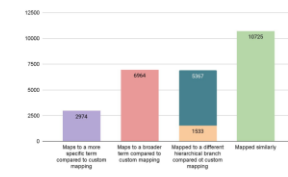


Figure 3 Hierarchical relationships of mappings to SNOMED (Blue - text similarity to source term is higher in custom mapping, yellow - text similarity to source term is higher in vendor mappings)

**Discussion and conclusion (cont.):** When SME-developed and vendor-derived SNOMED mappings diverged hierarchically, we used computed text similarity scores as an objective arbitration metric. In 5,367 of 6,900 cases (77.8%), SME-developed mappings demonstrated superior semantic alignment with source terms. These results underscore the need for standardized methodologies to systematically evaluate mapping quality and granularity across vocabularies. Future development of comprehensive quality frameworks incorporating multiple evaluation metrics and AI-assisted validation tools could enable more reproducible, scalable mapping processes, ultimately strengthening the reliability of evidence generated from global observational health data networks.



Tetiana Orlova, Mikita Salavei, Maria Khitrin, Tatsiana Skuhareuskaya





# #OHDSISocialShowcase This Week

## Friday

### Achievements, challenges, and future directions of the EXTERNAL\_EXPOSURE table as an OMOP extension for GIS research

(**Polina Talapova**, Andrew Williams, Jared Houghtaling, Kyle Zollo-Venecek, Maksym Trofymenko, Jay Greenfield, Timothy Norris, Robert Miller, Jimmy Phuong, Anne Thessen, Timothy D. Rossi)



### As health does not happen in a vacuum, EXTERNAL\_EXPOSURE helps OMOP represent the world around the patient

This extension links where people lived, when they lived there, and what exposures they experienced – while preserving standardization, provenance, and compatibility with federated analytics.

#### Title: Achievements, challenges, and future directions of the EXTERNAL\_EXPOSURE table as an OMOP extension for GIS research

##### Background

- Environmental and social exposures shape health, but OMOP historically lacked native support for representing them.
- Exposome research requires linking place-based context to person-level clinical timelines.
- The OHDSI GIS Working Group addressed this gap with EXTERNAL\_EXPOSURE and LOCATION\_HISTORY.
- The goal is a standardized, privacy-preserving, analytically tractable way to treat external exposures as first-class data elements in OMOP.

##### Objectives

- To implement a standardized OMOP-based framework for representing person-level environmental and social exposures across space and time.
- To support reproducible, federated observational research on exposure and SDOH effects alongside clinical data.

##### Methods

- Designed EXTERNAL\_EXPOSURE as an OMOP-style event table for person- and location-linked exposures with standardized concepts, time intervals, provenance, spatial relationships, and numeric or categorical values.
- Used LOCATION\_HISTORY to model residential trajectories as location\_id plus date intervals.
- Assigned exposures only when residential and exposure time windows overlapped.
- Built the data toolchain for implementation:



**Gaia Toolchain**

- gaiaCore: Harmonize external data to OMOP format
- gaiaDB: Persist exposures to exposure tables
- gaiaCatalog: Metadata cataloging and search interface
- gaiaDecker: Query and visualize data, generate reports

- Ran metadata-driven ETL pipelines to harmonize external datasets, perform spatial joins to residential locations, and load provenance-traceable records into EXTERNAL\_EXPOSURE.
- Applied the GIS Vocabulary Package to standardize environmental and SDOH concepts, geographies, and spatial relationships.

##### Results

- In 2024, the team released a fully documented, publicly available first version of the schema, vocabulary extensions, ETL conventions, and toolchain components.
- The pipeline was demonstrated on synthetic data, successfully loading temporally aligned exposures such as PM2.5, deprivation indices, and climate exposures into EXTERNAL\_EXPOSURE.
- The R4N Bridge2AI Chorus initiative has adopted the schema for community-level SDOH and environmental context integration. Chorus is mapping variables such as ZIP-code-level poverty, housing conditions, and pollutant levels to critical care patients using this model.
- The schema successfully represented composite indicators such as SVI using multiple rows per person with distinct concept\_id values and value\_as\_number for quantile rank.
- Analytical results from Chorus are forthcoming, but the implementation supports the schema's fitness for large-scale multimodal data.

##### Schema Relationship Flow



Person (Care patient demographic data) → Location History (Timeline of patient addresses) → Location (Physical geographic coordinates) → External Exposure (Environmental data links)

##### Patient Environmental Exposure Timeline



Initial Residence (Home and patient's details) → New Address (Patient moves to location X) → Data Tracking (Tracks longitudinal PM2.5, SVI, Climate Data) → Exposure Analysis (Links cumulative patient exposure history)

##### Why it is better?

- This moves OMOP closer to representing not only what happened in care, but also what happened around the patient.
- The design is structurally OMOP-native enough to support ETL consistency, provenance tracking, and future analytical needs.
- External exposures can now participate in cohort definitions, temporal logic, and distribution – not just sit in a sidebar file.
- For OHDSI, this opens a practical path toward exposure-driven real-world evidence generation across networks.

##### Limitations

- Environmental datasets vary in spatial resolution, temporal resolution, coverage, and units, requiring strong metadata and conversion logic.
- Spatial joins and temporal alignment increase ETL complexity and require geospatial expertise plus performant infrastructure.
- Scalability remains an issue for repeated measures, especially daily exposures across millions of individuals.
- Some use cases need better support for aggregated indicators and categorical encodings, prompting proposed schema revisions.
- Broader adoption is constrained because the table is not yet part of the OMOP core specification.
- Full analytical use may require enhancements in ATLAS and HADES to better support exposure-specific semantics.

##### Conclusion

**EXTERNAL\_EXPOSURE** provides a standardized mechanism to represent person-level environmental and social exposures in OMOP CDM. The schema is already implemented, usable, and evolving – positioning OHDSI networks to study how place and health interact with more rigor and less improvisation.

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# 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?**



**The weekly OHDSI community call is held  
every Tuesday at 11 am ET.**

**Everybody is invited!**

**Links are sent out weekly and available at:**  
**[ohdsi.org/community-calls-2026](https://ohdsi.org/community-calls-2026)**





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