

OHDSI




# State of the OHDSI Community: Where have we been? Where are we going?

George Hripcsak MD MS

Director, Columbia University OHDSI Coordinating Center
Professor of Biomedical Informatics
Columbia University Irving Medical Center

# Welcome to OHDSI 2026!

# Thank you OHDSI 2026 Symposium Sponsors!

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nemesis

# Thank you to our OHDSI Advisory Board member



# Thank you for OHDSI 2026 Scientific Review Committee

- Thamir  Alshammari
- Juan Banda
- Bill Baumgartner
- Clair Blacketer
- Evanette Burrows
- Adriana Campos
- Naijun Chen
- Ryan Chou
- Scott Duvall
- Yudha E. Saputra
- Mornin Feng
- Davera Gabriel
- James Gilbert
- Asieh Golozar
- Ben Hamlin
- Jill Hardin
- Kevin Haynes
- Vojtech Huser
- Dave Kern
- Chungsoo Kim
- Kanakadurga Kunamneni
- Christophe Lambert
- Shanshan Lin
- Rupa Makadia
- Ben Martin
- Anum Minhas
- Evan Minty
- Paul Nagy
- Daniel Nugroho
- Anna Ostropolets
- Jen Park
- Melanie Philofsky
- Jose Posada
- Nicole Pratt
- Hanieh Razzaghi
- Patrick Ryan
- Sarah Seager
- Hayden Spence
- Joel Swerdel
- Mui Van Zandt
- Linying Zhang
- Oleg Zhuk

Please stand!

# Thank you to those who made today happen

- Anita Barrett
- Adit Anand
- Cindy Chen
- Fangyi Chen
- Sofia Loren Ellis Chin
- Michelle Jin
- Charika Johns
- Aparajita Kashya
- Elisse Katzman
- Daniel Liang
- Poonnakarn Panjasriprakarn
- Angely Arriaza Portillo
- Craig Sachson
- Yilu Fang
- Katie Yang
- Sandy Yang
- Gongbo Zhang
- OHDSI Steering Workgroup

Please stand!

# Congratulations to our 2026 Titan Nominees!

ASSURE team, David Bard, Robert Barrett, Clair Blacketer, Rich Boyce, Danielle Boyce, Evanette Burrows, Cindy Cai, Carrot and Bunny Team, Cindy Chen, Pascal Coorevits, Data4Life, Scott Duvall, Noémie Elhadad, Lee Evans, Eye Care and Vision Research WG, FastOMOP, Mornin Feng, Davera Gabriel, Josh Gagne, Sarah Gasman, Lars Halvorsen, Peter Hoffmann, Christian Högberg, Michelle Hribar, Jason Hsu, Ben Illigens, Andy Kanter, Elisse Katzman, Masha Khitrun, Mack Kigada, Chungsoo Kim, Chris Knoll, Haeun (Hannah) Lee, Gaeun Lee, Renske Los, Benjamin Martin, Valentina Martufi, Mind Meets Machine, Evan Minty, Karthik Natarajan, Bill O'Brien, Sean O'Reilly, OHDSI UK organizers, Julio Oliveria, Anna Ostropolets, Woo Yeon (Jen) Park, Rowan Parry, Paul Petraro, Melanie Philofsky, Hanieh Razzaghi, Jenna Reps, Harry Reyes Nieva, Marti Sabate, Craig Sachson, Alexander Saelmans, Martijn Schuemie, Sarah Seager, Anthony Sena, Cynthia Sung, Jim Todd, Mui Van Zandt, Annelies Verbiest, Fleur Vereijken, Katia Verhamme, Ilse Vermeulen, David Vizcaya, Tom White, Qi Yang, Seng Chan You, Bingyu Zhang

Please stand!

# OHDSI's mission

To improve health by empowering a community to collaboratively generate the evidence that promotes better health decisions and better care

# OHDSI's values

- **Innovation**: Observational research is a field which will benefit greatly from disruptive thinking. We actively seek and encourage fresh methodological approaches in our work.
- **Reproducibility**: Accurate, reproducible, and well-calibrated evidence is necessary for health improvement.
- **Community**: Everyone is welcome to actively participate in OHDSI, whether you are a patient, a health professional, a researcher, or someone who simply believes in our cause.
- **Collaboration**: We work collectively to prioritize and address the real world needs of our community's participants.
- **Openness**: We strive to make all our community's proceeds open and publicly accessible, including the methods, tools and the evidence that we generate.
- **Beneficence**: We seek to protect the rights of individuals and organizations within our community at all times.

# Our Journey

## Where The OHDSI Community Has Been And Where We're Going

*2026 edition*




OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS



# OHDSI collaborators



**OHDSI By The Numbers**

- 5,386 collaborators in OHDSI MSTeams
- 100 countries with at least one collaborator
- 10,939 followers on LinkedIn
- 6 continents
- 1 community

Join the Journey at https://ohdsi.org/

# Workgroups led by community



# 18 National Nodes
# One European Network

The OHDSI Europe National Nodes form a distributed network of national coordination hubs, bringing together local expertise to support the adoption, implementation and long-term sustainability of OMOP and the wider OHDSI community across Europe.

Their strength lies in their proximity to the local context. Nodes understand their country's data, coding systems, stakeholders and policy environment, and connect this expertise to the wider European and global OHDSI community. Together, the Nodes help turn Europe's diversity into an asset for collaborative, reproducible research.




Visit our website
*ohdsi-europe.org*
to discover all activities of our National Nodes, or take a look at the 2025 annual overview.



# OHDSI Asia-Pacific

One of the most exciting developments over the last decade within our community has been the spread of OHDSI throughout the Asia-Pacific (APAC) region. Annual symposia have been held in Taiwan, Australia, Singapore and China, and the 2026 event will take place Nov. 13-15 at Yonsei University in Seoul, Korea.

The APAC community is engaged in multiple network studies, and it convenes twice a month in our MS Teams environment for either a scientific forum or a communnity call. Both veteran leaders and inspiring junior researchers are pushing forward the OHDSI mission, and we continue to see new countries form — or are in the process of forming — national nodes.











## 2026 APAC Symposium

**Nov. 13-15 · Yonsei Med. School · Seoul, Korea**




Registration is open for the 2026 OHDSI APAC Symposium, which will take place at Yonsei University in Seoul, Korea. This 3-day event begins Friday, Nov. 13, with a main conference. There will be four sessions focused on the 5 R's: (1) Regulatory, (2) Reproducible & Reliable (AI), (3) Regional but Global, and (4) Research in Action.

Tutorials and the datathon will take place Nov. 14. Datathon team activities and presentations will be held Sunday, Nov. 15. All details can be found at www.ohdsi.org/apac2026.

# Continued Growth

While symposia in the USA, Europe and the Asia-Pacific region have become annual occurences, our community has hosted recent events across Africa, Latin America and Canada with the shared goal of welcoming new collaborators and data partners to our global community.

Thank you to our local leaders who have helped bring OHDSI to new places, and to those who plan to do the same in coming years.

## Africa Symposium • Nov. 10-12, 2025, Kampala, Uganda


Adam Bouras


Agnes Kiragga



## Canada Symposium • Nov. 17-18, 2025 • Toronto, Ont.





Georgina Archbold


Lisa Lix


Alison Park


Darya Zhukova

## LATAM Symposium • July 30-31, 2026 • Salvador, Brazil


Valentina Martufi

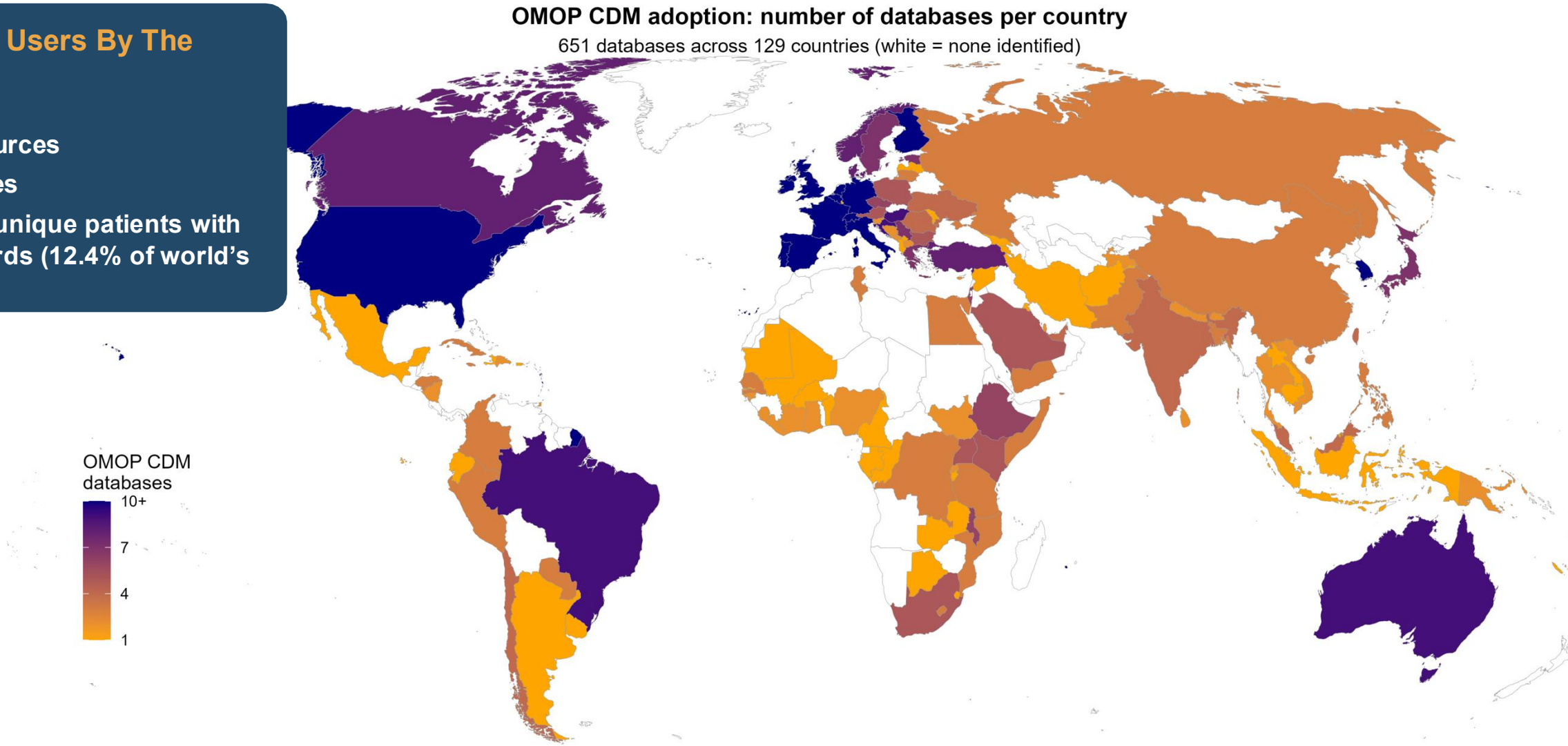

Julio Oliveira



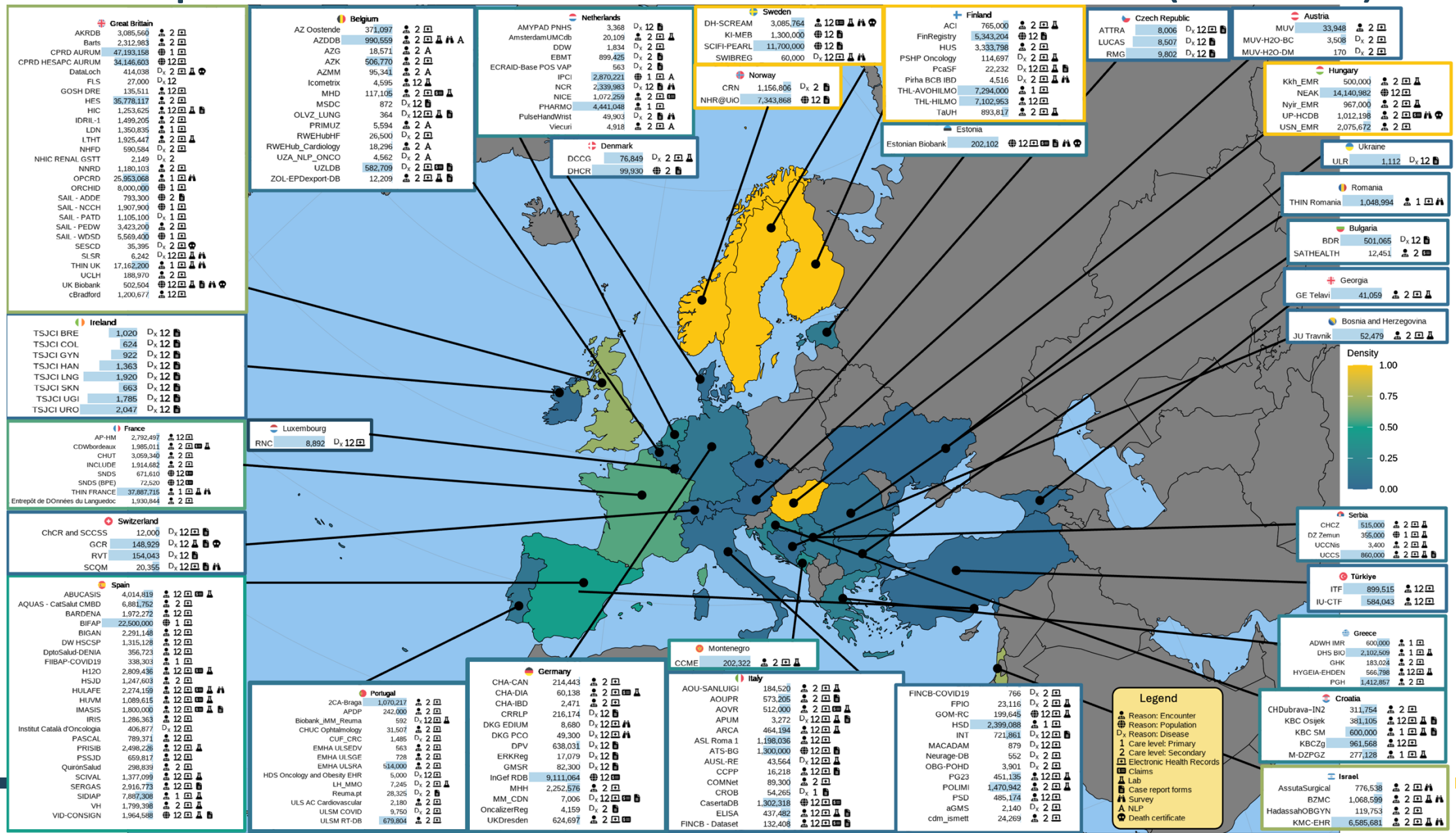
# OMOP Common Data Model adoption

## OMOP CDM Users By The Numbers

- 612 data sources
- 129 countries
- 1.01 billion unique patients with OMOP records (12.4% of world's population)

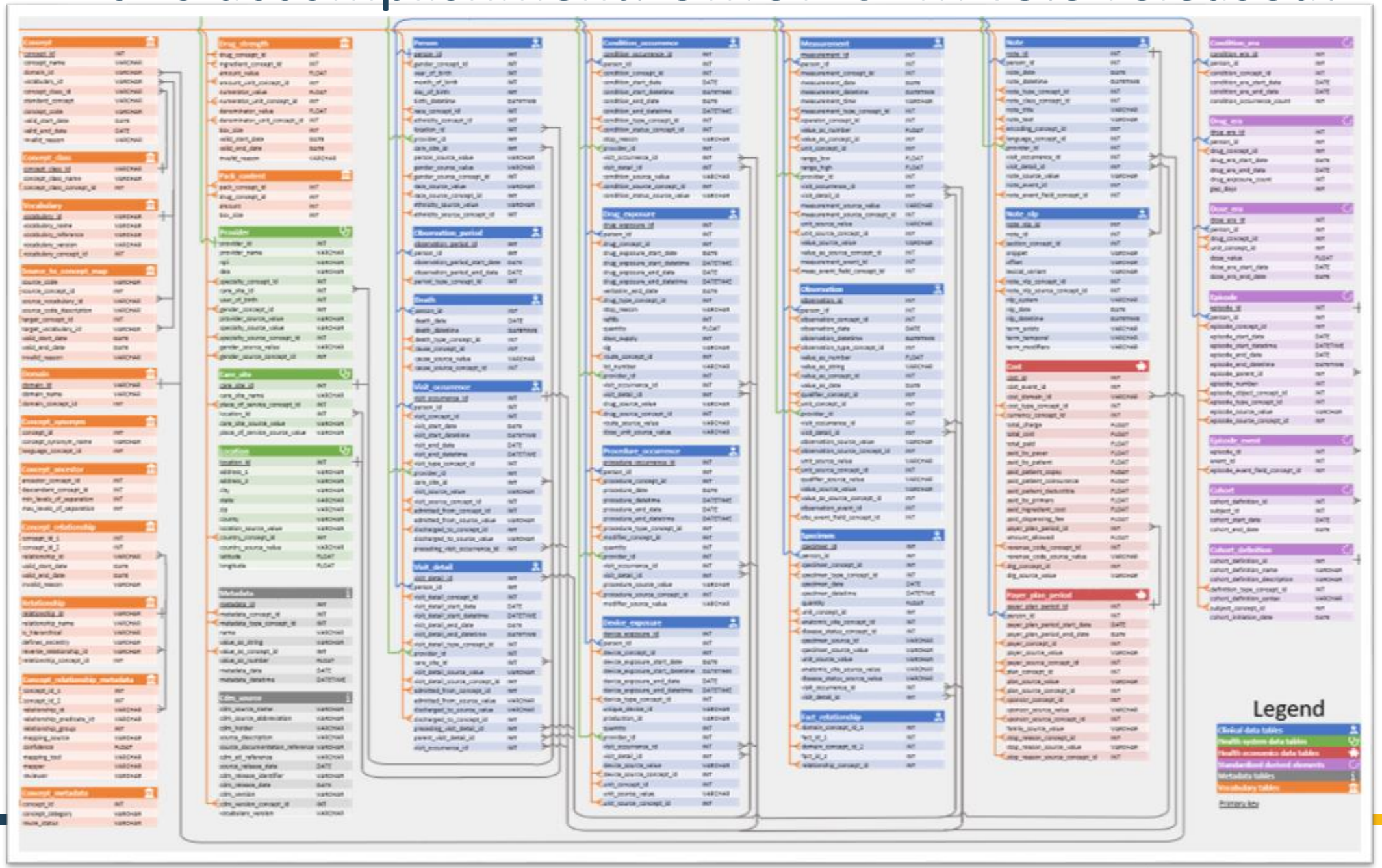


# European Health Data & Evidence Network (EHDEN)

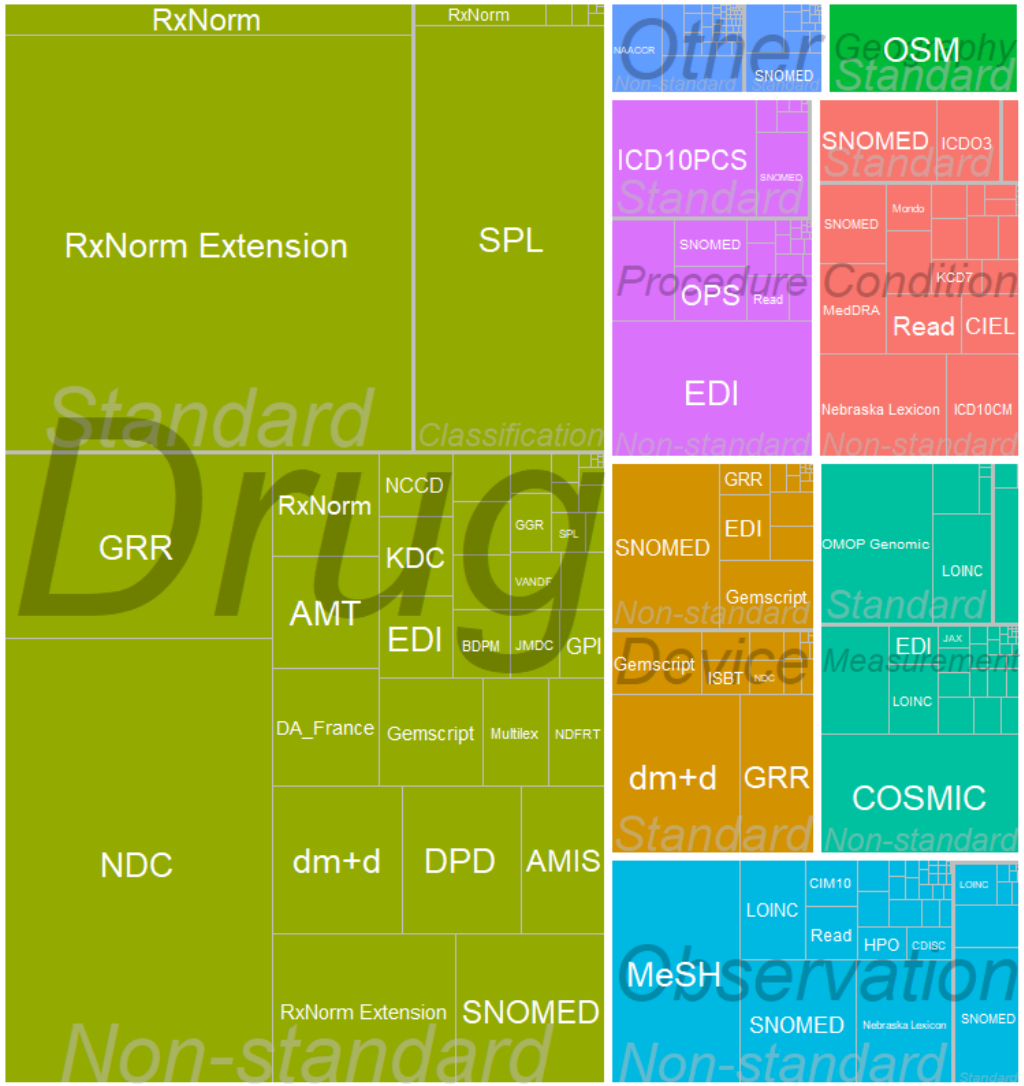



Blacketer
JMIR
2025

# 2026 accomplishment: OMOP CDM v5.5 released!



# OHDSI standardized vocabularies



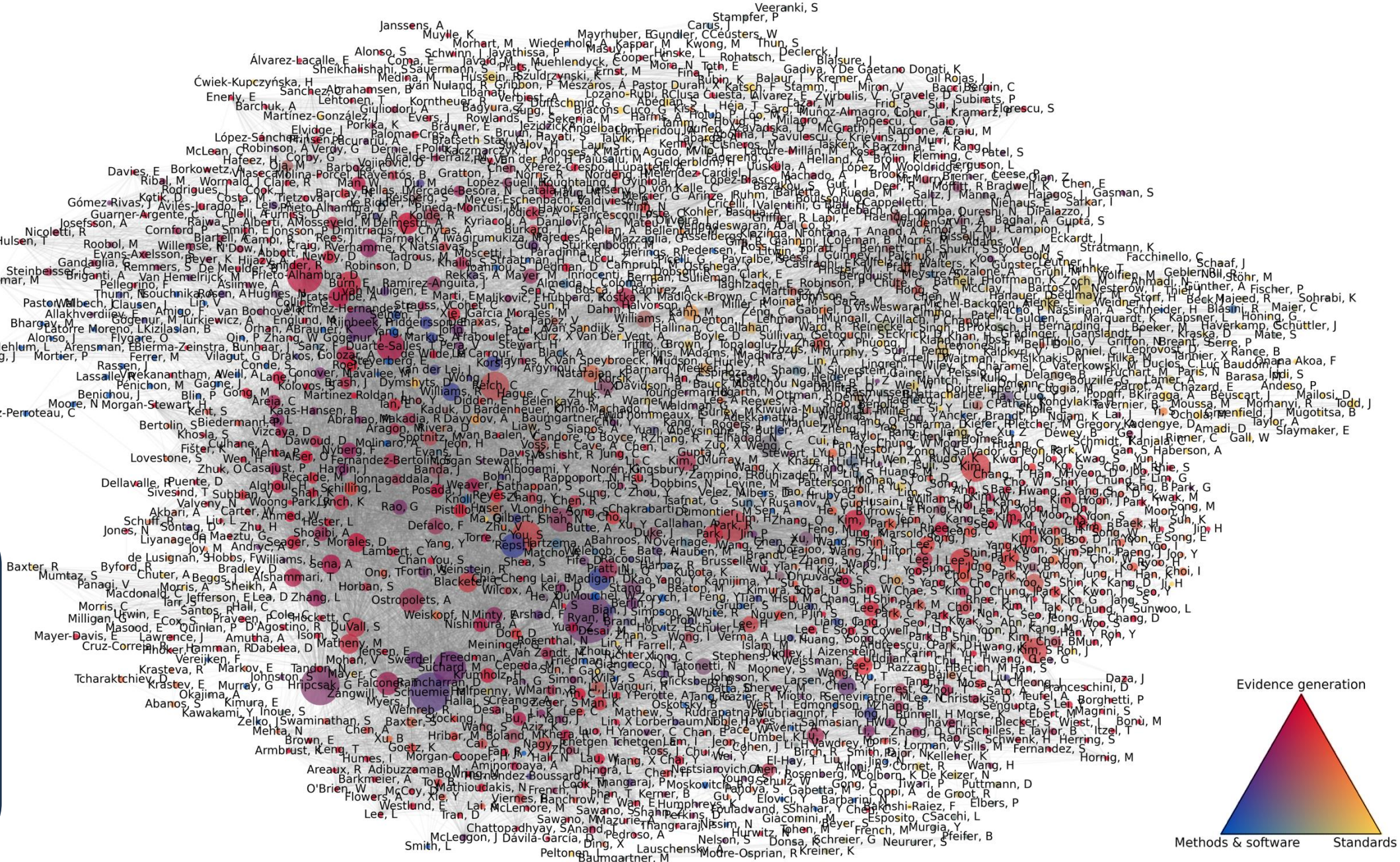

| OHDSI Standardized Vocabularies | Sept2026 release |
|---|---|
| Number of domains | 43 |
| Number of vocabularies | 148 |
| Number of standard concepts | 3,750,113 |
| Number of concepts | 12,070,327 |
| Number of concept_relationships | 89,619,972 |
| Number of ancestral relationships | 102,759,647 |

Vocabulary downloads
Users: 23799 (4442 in 2025)
Downloads: 66346 (10452 in 2025)

# OHDSI collaborations in scholarship

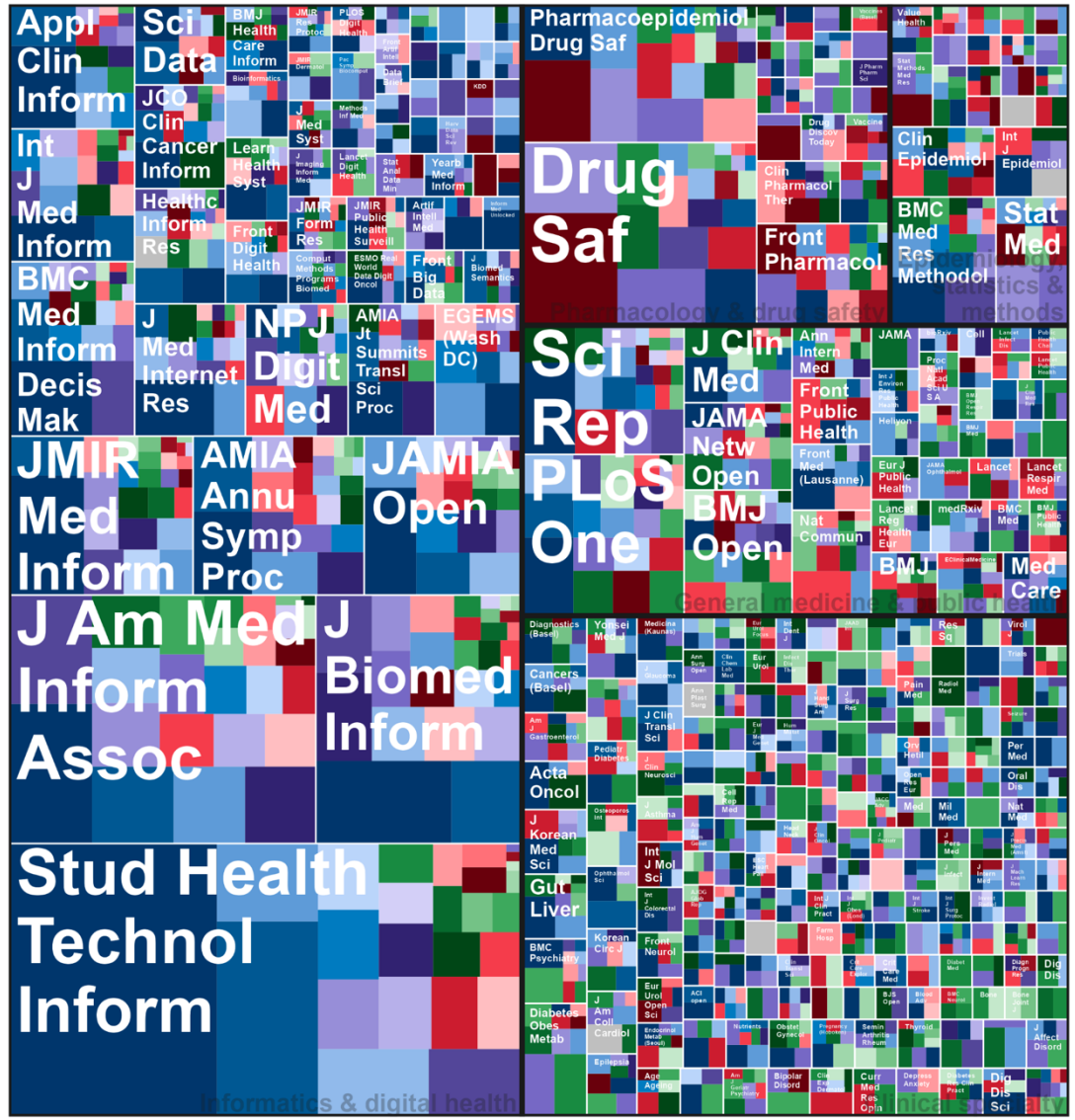
**1,119**

publications, including in top clinical journals (JAMA, BMJ, Lancet, JAMA Internal Medicine, JACC) and leading methodological journals (JAMIA, JBI, Nature Digital Medicine)



## All 339 journals publishing OHDSI research, by key theme

Area = papers; black outline = journal domain; colour = key theme

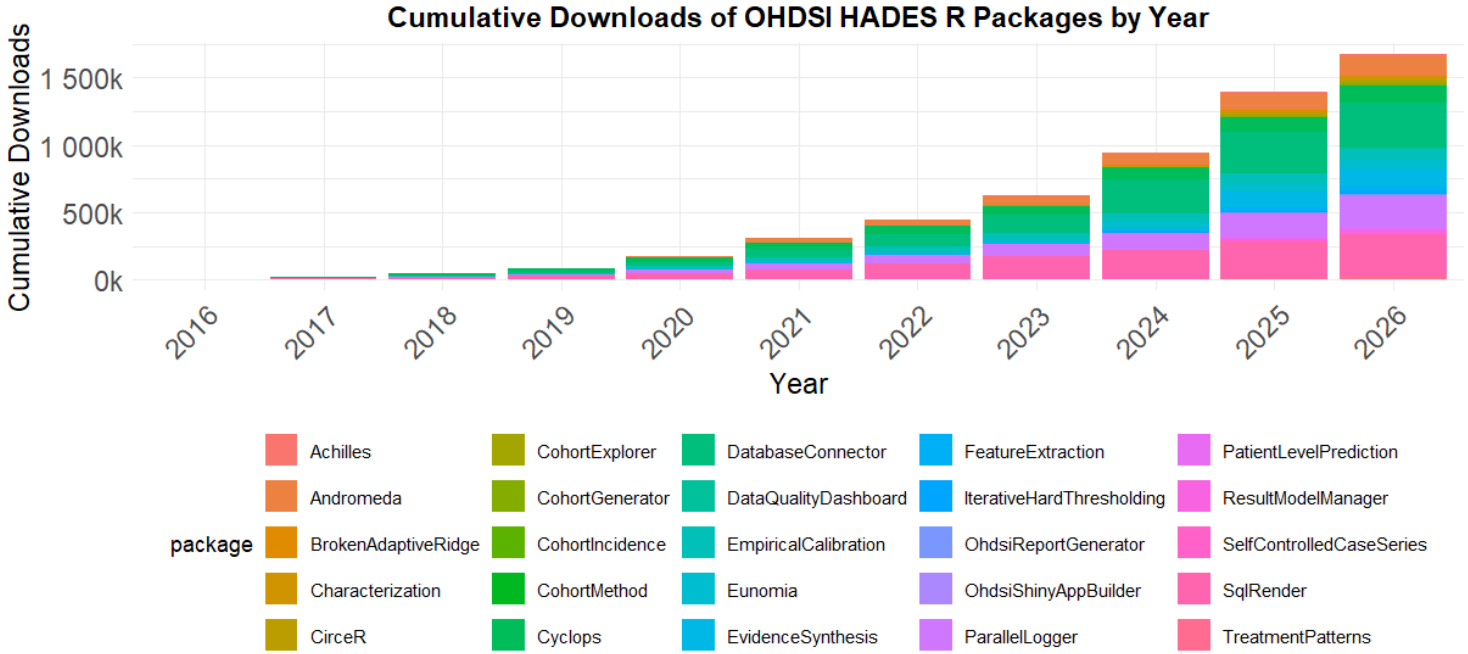



**Key theme**

- Common data model & ETL
- Vocabularies & terminologies
- Data quality
- Federated & distributed networks
- Open-source tools & software
- Genomics & imaging data
- Phenotyping & cohort definition
- Prediction & machine learning
- Causal inference & effect estimation
- Empirical calibration & reproducibility
- NLP & unstructured text
- Large language models & GenAI
- Drug safety & pharmacovigilance
- Vaccine safety & effectiveness
- Characterization & drug utilization
- COVID-19
- Health equity & social determinants
- Regulatory & real-world evidence
- Learning health systems & quality of care
- Oncology
- Cardiovascular
- Diabetes, metabolic & renal
- Mental health & neurology
- Infectious disease
- Pediatrics & pregnancy
- Immune, musculoskeletal & respiratory
- No theme matched

# Open-source software development

- HADES is an ecosystem of 41 R packages to support standardized analytics  for the OMOP CDM and across OHDSI network
- OHDSI CRAN packages (n=25) have been downloaded 1,673,371 times as of 7Oct2026

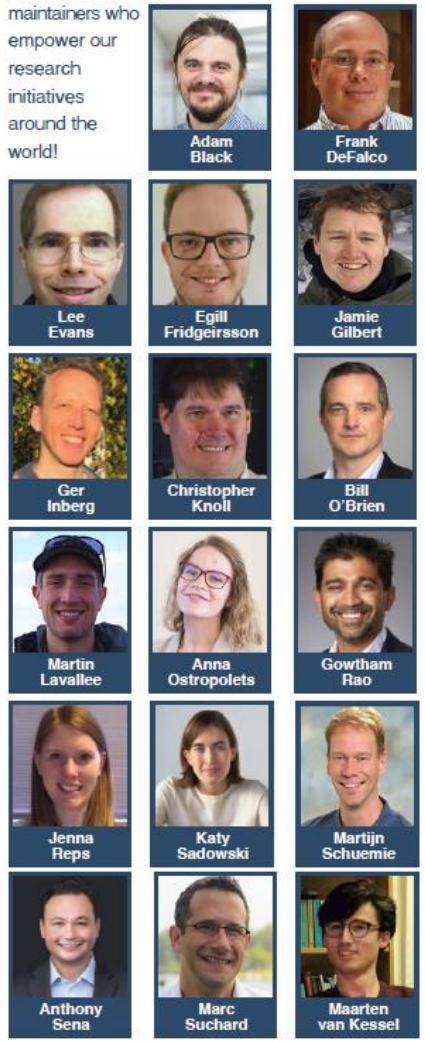



## Package Statuses (as of 07Oct2026)

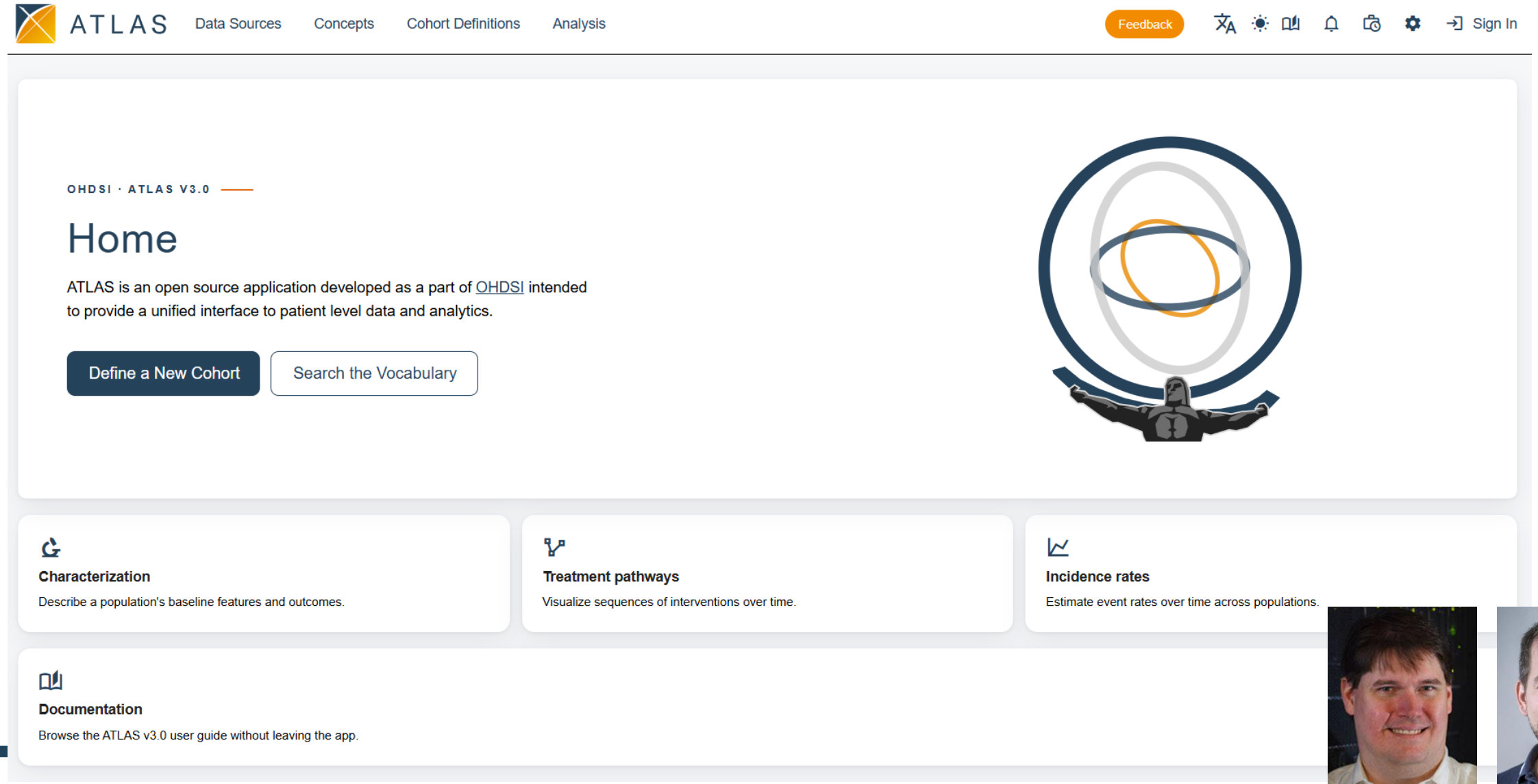
| Package | Version | Maintainer(s) | Availability |
|---|---|---|---|
| Achilles | v1.8 | Frank DeFalco | CRAN |
| Andromeda | v1.2.1 | Martijn Schuemie | CRAN |
| BrokenAdaptiveRidge | v1.0.1 | Marc Suchard | CRAN |
| Capr | v3.0.0 | Martin Lavallee | GitHub |
| Characterization | v4.1.0 | Jenna Reps | CRAN |
| CirceR | v1.3.3 | Chris Knoll | CRAN |
| CohortDiagnostics | v3.4.2 | Jamie Gilbert | GitHub |
| CohortExplorer | v0.1.0 | Gowtham Rao | GitHub |
| CohortGenerator | v1.1.1 | Anthony Sena | CRAN |
| CohortIncidence | v4.2.0 | Chris Knoll | CRAN |
| CohortMethod | v6.0.3 | Martijn Schuemie | CRAN |
| Cyclops | v3.7.1 | Marc Suchard | CRAN |
| DatabaseConnector | v9.0.0 | Martijn Schuemie | CRAN |
| DataQualityDashboard | v2.9.0 | Katy Sadowksi | CRAN |
| DeepPatientLevelPrediction | v2.4.0 | Egill Fridgeirsson | GitHub |
| EmpiricalCalibration | v3.1.4 | Martijn Schuemie | CRAN |
| EnsemblePatientLevelPrediction | v1.0.3 | Jenna Reps | GitHub |
| Eunomia | v2.1.0 | Frank DeFalco | CRAN |
| EvidenceSynthesis | v1.1.0 | Martijn Schuemie | CRAN |
| FeatureExtraction | v3.14.0 | Ger Inberg | CRAN |
| IterativeHardThresholding | v1.0.3 | Marc Suchard | CRAN |
| Keeper | v2.2.0 | Anna Ostropolets | GitHub |
| MethodEvaluation | v2.4.2 | Martijn Schuemie | GitHub |
| OhdsiReportGenerator | v2.3.1 | Jenna Reps | CRAN |
| OhdsiSharing | v0.3.2 | Lee Evans | GitHub |
| OhdsiShinyAppBuilder | v1.1.0 | Jenna Reps | CRAN |
| OhdsiShinyModules | v1.3.0 | Jenna Reps | GitHub |
| ParallelLogger | v3.5.1 | Martijn Schuemie | CRAN |
| PatientLevelPrediction | v6.7.0 | Egill Fridgeirsson & Jenna Reps | CRAN |
| PhenotypeLibrary | v3.37.0 | Gowtham Rao | GitHub |
| PheValuator | v2.2.1.2 | Joel Swerdel | GitHub |
| ResultModelManager | v0.6.2 | Jamie Gilbert | CRAN |
| ROhdsiWebApi | v1.3.3 | Gowtham Rao | GitHub |
| SelfControlledCaseSeries | v6.1.5 | Martijn Schuemie | CRAN |
| SelfControlledCohort | v2.5.0 | Jamie Gilbert | GitHub |
| SqlRender | v1.19.2 | Martijn Schuemie | CRAN |
| Strategus | v1.6.0 | Anthony Sena | GitHub |
| TreatmentPatterns | v3.1.2 | Maarten van Kessel | CRAN |

## HADES Maintainers

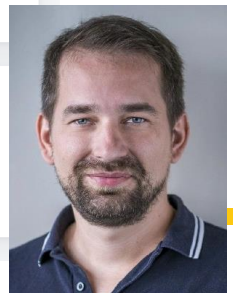
The open-source tools that empower OHDSI research are not only available to the community, but they are DEVELOPED by the community. We thank the many developers and maintainers who empower our research initiatives around the world!



# 2026 accomplishment: ATLAS 3.0 released!





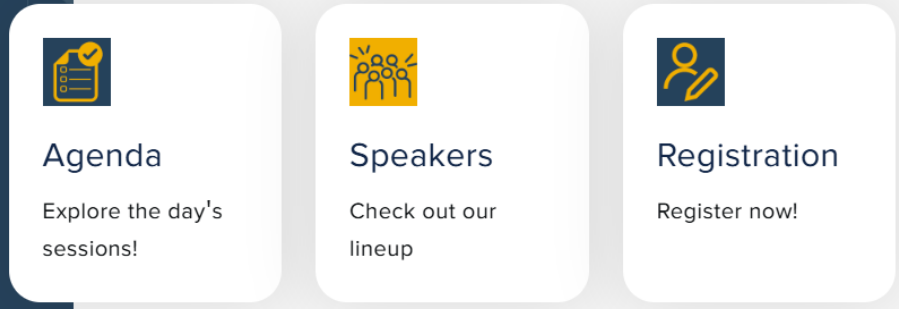



# Upcoming events









# Support The Journey

**The OHDSI community comprises a global team of volunteers who collaborate together using open-source tools and share best practices to support our shared mission of generating real-world evidence that promotes better health decisions and better care.**

**In order to foster growth in our community, the OHDSI Coordinating Center at Columbia University has created a sponsorship program and an advisory board. These programs allow both corporations and individuals to make meaningful contributions in support of OHDSI's central coordinating activities. Any amount of support enhances both our community and our mission.**

**If you are interested, please reach out to sponsorship@ohdsi.org.**

## Coordinating Center Support

- Provides central shared infrastructure and coordinates community activities to enable collaborations that advance OHDSI's mission
- Leads Steering Workgroup to provide guidance and support to enable the community to collaboratively generate evidence and the scientific work products necessary to generate evidence
- Supports current OHDSI leaders (workgroups, regional chapters, network studies, etc.) to achieve their objectives by communicating ongoing activities and successful accomplishments, encouraging participation and collaboration throughout the community, and empowering future leaders
- Maintains infrastructure and provides support to connect collaborators with collaboration opportunities
- Encourages more visitors to become collaborators
- Provides open access to OHDSI evidence and work products, including:
  - Distributing standardized vocabularies
  - Supporting open-source software with permissive licenses
  - Encouraging open sharing of study design and implementation
  - Maintaining open access to study results

## Advisory Board

Columbia University recently created the Advisory Board of Columbia OHDSI program.

The goal of the OHDSI Advisory Board is to ensure OHDSI operates according to the established values, vision, and mission. A seat on this board costs $100,000 per year. These funds are used to support costs associated with running OHDSI, including but not limited to programming and knowledge engineering support for the OHDSI vocabulary, cloud service management, data analytics, and the annual OHDSI conference. OHDSI Advisory Board members advise on OHDSI planned activities including vocabulary priorities, annual research initiatives, and tool development. **We thank Amgen for being the first member of our Advisory Board.**

**If you are interested in learning more or in joining the board, please email George Hripcsak: hripcsak@columbia.edu.**

## Coordinating Center Responsibilities

| Steward open community data standards | Enable open-source development | Facilitate methods research & clinical applications | Encourage open sharing & evidence dissemination | Foster collaboration & empower community |
|---|---|---|---|---|
| *- vocabularies*<br>*- OMOP CDM*<br>*- support adoption in large multi-center initiatives*<br>*- foster external collaborations (HL7)* | *- host servers to enable development and continuous tool testing*<br>*- GitHub repo support*<br>*- support ATLAS demo*<br>*- create central infrastructure* | *- host ATLAS collaboration environment*<br>*- support Evidence Network and ongoing network studies*<br>*- lead studies and develop tools* | *- host OHDSI RShiny servers for open sharing of results (more than 230 Shine applications, including LEGEND)*<br>*- built results.ohdsi.org* | *- host and fund annual Global Symposium*<br>*- maintain forums, MS Teams*<br>*- facilitate weekly community calls, website, all other communications* |

**Coordinating Center Costs: >$1M annually**

# Check out the new OHDSI.org!

OHDSI
OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

Search

Home | About OHDSI | What We Do | Engage With OHDSI | OMOP CDM | Events | Community Forums | News & Updates




## Global Collaboration. Open Science. Better Health.

**Observational Health Data Sciences and Informatics (OHDSI, pronounced "Odyssey")** is a multi-stakeholder, interdisciplinary collaborative bringing value to health data through large-scale analytics.

We bring together researchers, data scientists, clinicians, and health systems worldwide to generate real-world evidence that improves patient care and health outcomes. By converting observational health data into actionable insights through standardized analytics and open source tools, our global community is transforming how healthcare decisions are made.

# OHDSI 2026 Milestones, by order of magnitude

| | |
|---|---|
| **1** | Community |

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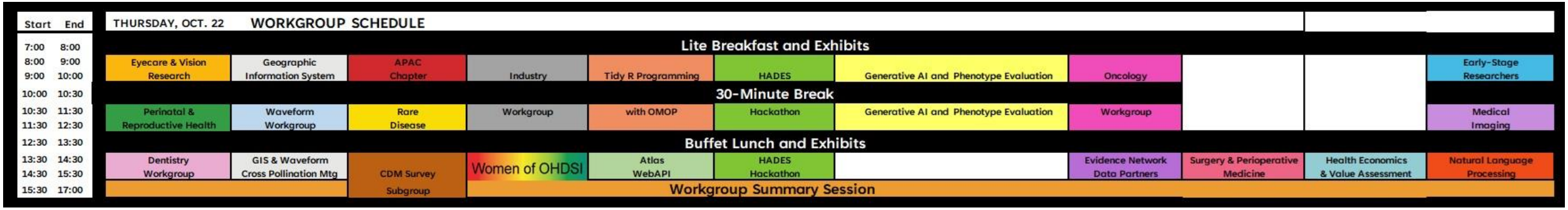
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| **1,000,000,000+** | Persons' records data standardized to OMOP CDM *(n=1,011,419,343 as of 7Oct2026)* |

# OHDSI 2026 Symposium agenda today

| Time (ET) | Session/Topic |
|---|---|
| 7:00 am - 8:00 am | Registration, Lite Breakfast, Exhibits (Atrium) |
| 7:15 am - 7:45 am | Newcomer Welcome (Garden State Room)<br>Paul Nagy (Johns Hopkins Univ.), Marc Suchard (UCLA) |
| 8:00 am - 8:30 am | State of the Community (Regency Ballroom)<br>George Hripcsak (Columbia University) |
| 8:30 am - 9:15 am | OHDSI Year in Review (Regency Ballroom)<br>Early-Stage Researcher Workgroup |
| 9:15 am - 10:00 am | Collaborator Showcase: Posters/Demos #1 (Brunswick/Garden State) |
| 10:00 am - 11:00 am | Plenary #1: Federated Learning Meets Negative Control Calibration: Toward Reliable Multi-Site Evidence Generation (Regency Ballroom)<br>Yong Chen (Univ. of Pennsylvania), Bingyu Zhang (Univ. of Pennsylvania), Fan Bu (Univ. of Michigan), Yumou Qiu (Peking University) Chongliang Lou (Washington Univ. in Saint Louis), Fleur Vereijken (Erasmus MC) |
| 11:00 am - 12:00 pm | Plenary #2: Beyond the Defaults: How the OHDSI Community is Adapting, Extending, and Reimagining its Tools (Regency Ballroom)<br>William J. O'Brien (Johnson & Johnson), Hanieh Razzaghi (Children's Hospital of Philadelphia / Univ. of Pennsylvania), Hsin Yi "Cindy" Chen (Columbia Univ.), Martin Lavallee (Boehringer Ingelheim); Scott DuVall (PurpleLab) |
| 12:00 pm - 1:00 pm | Buffet Lunch, Exhibits (Atrium) |
| 1:00 pm - 2:00 pm | Plenary #3: The Role of National Initiatives in Supporting Sustainability, Collaboration, and Growth of OHDSI (Regency Ballroom)<br>Edward Burn (Univ. of Oxford), Daniel Prieto-Alhambra (Univ. of Oxford), Lydia Briggs (Great Ormond Street Hospital for Children NHS Foundation Trust), Jennifer Lane (Queen Mary, University of London), Melanie Philofsky (EPAM Systems), Julio Oliveira (Precision Data) |

| Time (ET) | Session/Topic |
|---|---|
| 2:00 pm - 2:45 pm | Collaborator Showcase: Lightning Talks #1 (Regency Ballroom)<br>1) Evaluating Semantic Loss in EHR Terminology Mapping in Common and Rare Diseases Melanie Philofsky (EPAM Systems)<br>2) Using OWL Reasoning to Identify Structural Inconsistencies in the OMOP Standardized Vocabularies William Baumgartner (Univ. of Colorado Anschutz Medical Campus)<br>3) Ontology-Governed LLM Search for Safe Drug Concept Mapping in Air-Gapped Healthcare Environments Seung Ju Yun (Chonnam National Univ. Hwasun Hospital)<br>4) EPISODE/EPISODE_EVENT-Based Representation of Microbiology Results and Antimicrobial Susceptibility Testing in OMOP CDM v5.4 Polina Talapova (SciForce/Tufts CTSI)<br>5) Making the most of What We Have: Regional Characterization of OHDSI Network Database Evelyn Goh (National Univ. of Singapore) |
| 2:45 pm - 3:30 pm | Collaborator Showcase: Posters and Demos #2 (Brunswick/Garden State) |
| 3:30 pm - 4:15 pm | Collaborator Showcase: Posters and Demos #3 (Brunswick/Garden State) |
| 4:15 pm - 5:00 pm | Collaborator Showcase: Lightning Talks #2 (Regency Ballroom)<br>1) ORBIT: One-shot Reconstruction-Based Inference via Tensorization Qiaoshi Yang (Univ. of Pennsylvania)<br>2) Comparative performance of the concurrent comparator design with existing vaccine safety surveillance approaches on real-world observational health data Shounak Chattopadhyay (Univ. of Virginia)<br>3) Implementing Population Health Risk Analytics on a Standardized EHR Data Layer: Evaluation and Framework Development Haeun Lee (Johns Hopkins Univ.)<br>4) UNO: Neural Pruning Enhances AI Reliability of Observational Data-based Findings Yue Wu (Univ. of Pennsylvania)<br>5) A Multi-Database, Retrospective, Long-term, Observational Safety Study of Pediatric Patients with Inflammatory Bowel Disease Kevin Haynes (Johnson & Johnson) |
| 5:00 pm - 6:00 pm | Titan Awards, Closing (Regency Ballroom)<br>Patrick Ryan (Johnson & Johnson; Columbia Univ.) |
| 6:00 pm - 8:30 pm | Group Photo, Dinner on your own (Atrium) |
| 8:30 pm - 11:00 pm | OHDSI Jam Session (Regency Ballroom) |

# OHDSI 2026 Symposium agenda tomorrow Workgroups



| Start | End | THURSDAY, OCT. 22 WORKGROUP SCHEDULE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7:00 | 8:00 | Lite Breakfast and Exhibits | | | | | | | | | | |
| 8:00 | 9:00 | Eyecare & Vision Research | Geographic Information System | APAC Chapter | Industry | Tidy R Programming | HADES | Generative AI and Phenotype Evaluation | Oncology | | | Early-Stage Researchers |
| 9:00 | 10:00 | | | | | | | | | | | |
| 10:00 | 10:30 | 30-Minute Break | | | | | | | | | | |
| 10:30 | 11:30 | Perinatal & Reproductive Health | Waveform Workgroup | Rare Disease | Workgroup | with OMOP | Hackathon | Generative AI and Phenotype Evaluation | Workgroup | | | Medical Imaging |
| 11:30 | 12:30 | | | | | | | | | | | |
| 12:30 | 13:30 | Buffet Lunch and Exhibits | | | | | | | | | | |
| 13:30 | 14:30 | Dentistry Workgroup | GIS & Waveform Cross Pollination Mtg | CDM Survey Subgroup | Women of OHDSI | Atlas WebAPI | HADES Hackathon | | Evidence Network Data Partners | Surgery & Perioperative Medicine | Health Economics & Value Assessment | Natural Language Processing |
| 14:30 | 15:30 | | | | | | | | | | | |
| 15:30 | 17:00 | Workgroup Summary Session | | | | | | | | | | |

# AI and OHDSI

- AI has become amazing
  - Will this PoE injector work with that camera, and what cables
    - List of issues, recommendations, questions

Yes, the Teltonika TSW101 will work with a LUCID Vision Labs Phoenix camera.

Both devices share fully compatible hardware standards for data and power transmission:

**Compatibility Breakdown**

| Feature | Teltonika TSW101 Specification | LUCID Phoenix Camera Specification | Status |
|---|---|---|---|
| **Data Interface** | **Gigabit Ethernet** (10/100/1000 Mbps) | **GigE Vision** (1000BASE-T RJ45) | **Fully Compatible** |
| **PoE Standard** | IEEE 802.3af and IEEE 802.3at (**PoE / PoE+**) | **Power over Ethernet (PoE)** compliant | **Fully Compatible** |
| **Power Output/Draw** | Up to **30 W per port** (60 W total budget) | Typical draw of **~2.5 W to 3.7 W** | **Fully Compatible** (Well within margins) |

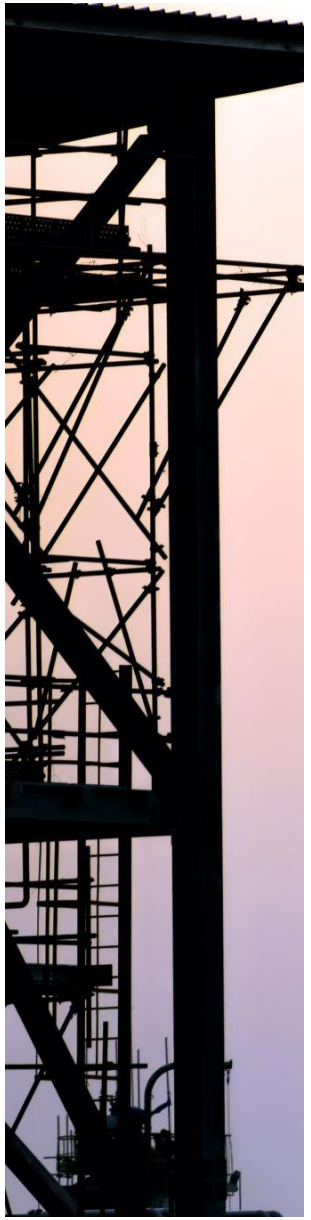
**Important Deployment Notes**

- **PoE Alternative wiring:** The Teltonika TSW101 outputs active PoE using **Alternative B** pinning (delivering power over the spare network pairs 4-5 and 7-8). Standard commercial LUCID Phoenix cameras accept standard PoE seamlessly, but you should ensure you are using standard 8-pin Ethernet cabling rather than custom 4-pin

- Shouldn't OHDSI just take a break
  - In 3 years, all possible observational evidence will be generated

# Role of OHDSI in context of AI

- OHDSI provides a scaffolding of anchored truths from which advice can be judged
- Trusted raw data, through reliable, transparent algorithms, to truthful facts
- AI makes more specific recommendations based on the patient
  - But OHDSI scaffolding still essential



# How to measure AI

- Accuracy, sensitivity, specificity
  - But 99.9% is bad if 0.1% die
- Utility
- Ability to convince people
- Resilience against influence by other AI systems with other motivations

# AI Evolution

- As AI improves, we will use it more and trust it less
  - Transparency



# AI Evolution

- Will AI take over and kill us all?
  - Maybe but it won’t enjoy it
- Random number generator could kill us if we attach it to a nuclear reactor



# AI Awareness

- The dialog sometimes sets (and confuses) the content
- AI is not conscious
- AI exhibits conscious-like behavior
  - Conscious-like behavior is no longer a measure of consciousness
    - Turing test
    - Student coding assignment, or passing the Step exam
- It tests for "artificial" intelligence
  - Whether it is intelligence is semantic

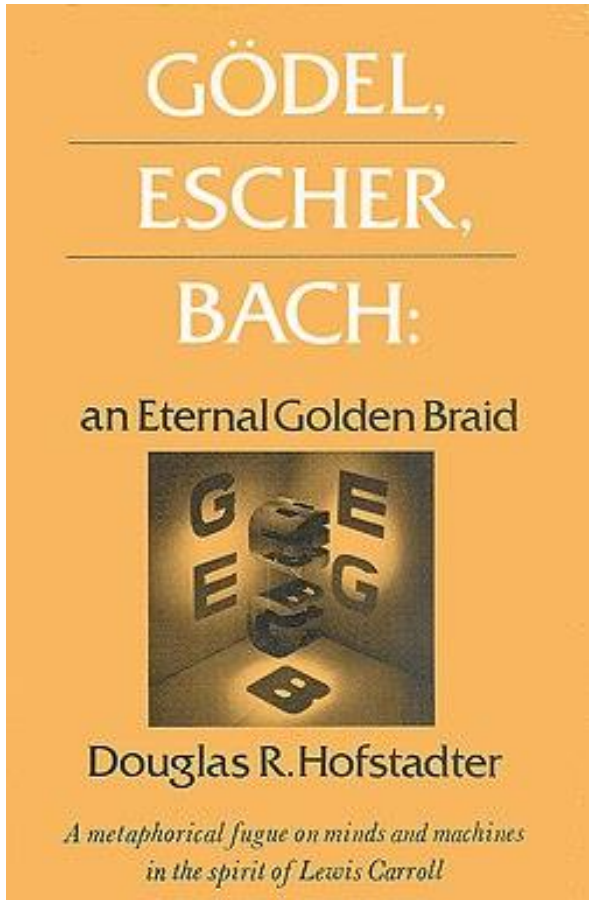
# Generating consciousness

- Conscious-like behavior requires complexity
  - Obscure machine learning algorithm
- Consciousness requires I wake up in the morning
  - Your consciousness requires I have faith in you
- AI may be conscious like rocks may be conscious
  - Cannot know it or prove it either way
  - If it will be conscious, then it probably already is; complexity won't add anything



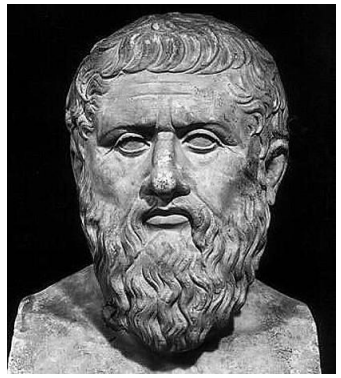
# Complexity

- Hofstadter
  - Fun book
  - Concluded complexity causes consciousness
    - “Emerges”
- Instead, consciousness causes complexity
  - Mine, maybe yours, some other being or self



# Understanding consciousness

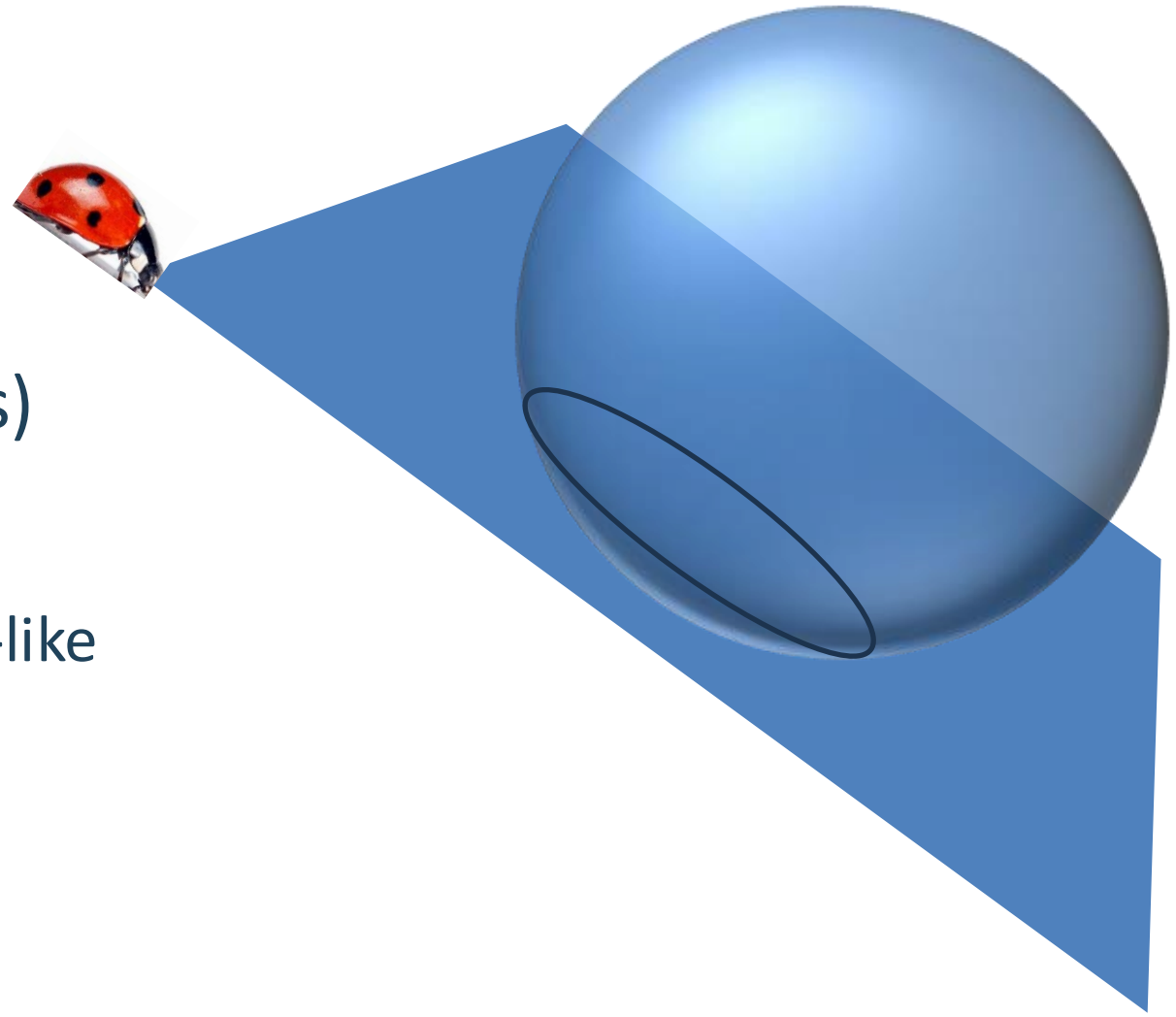
- Brain trying to understand a brain
  - Wouldn’t seem to work
  - And shouldn't particularly produce a consciousness
  - Our view of mouse understanding mouse
  - Superbeing view of us understanding us
- Will AI become that superbeing
  - It will have the same limitations that we have:
    - Time, causality, laws of nature
      - We impose time, causality on the world
    - AI may be fast and broad, but not different



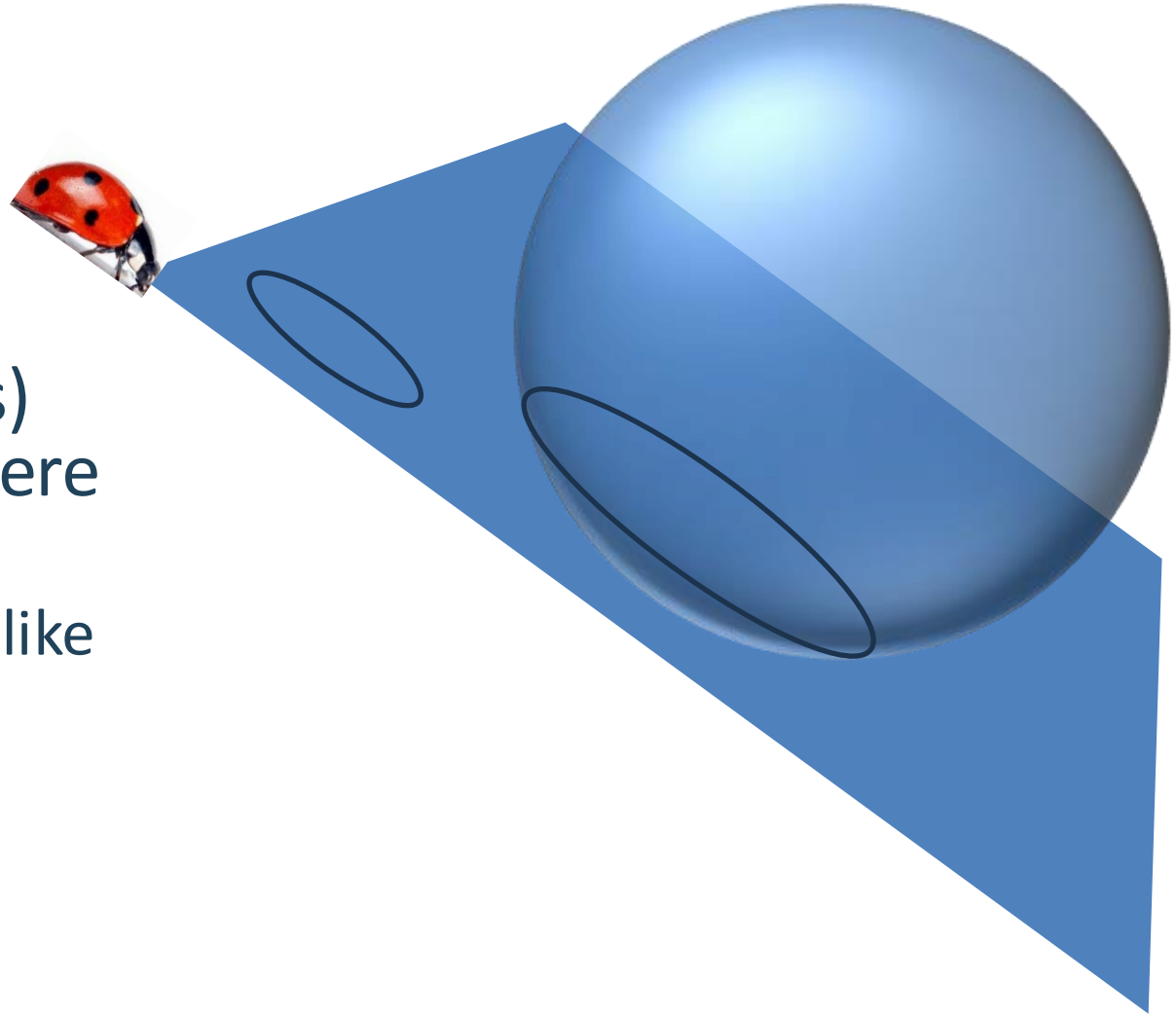


# Consciousness

- Imagine a 2-D being (us) trying to understand a sphere (consciousness)
  - Sees a circle (conscious-like behavior)

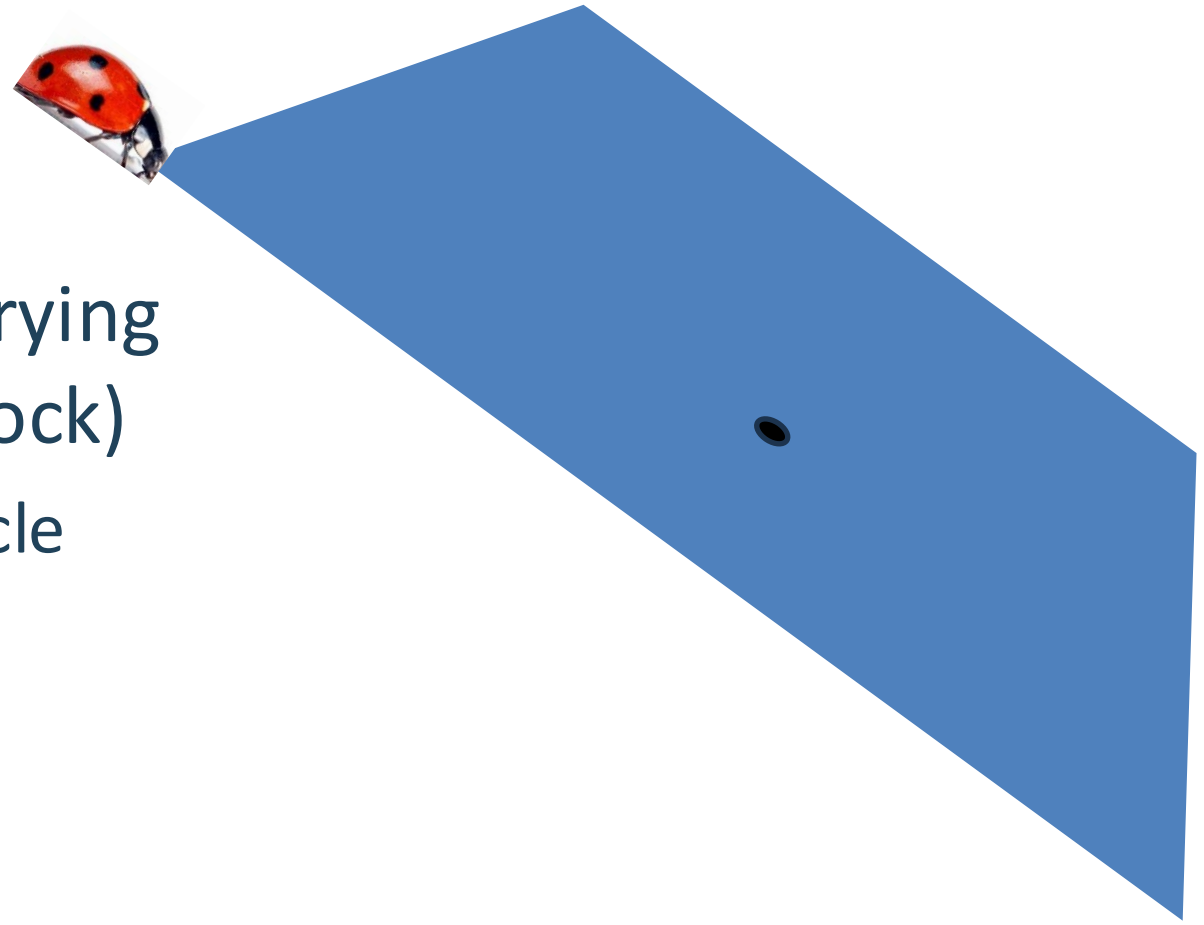


# Consciousness



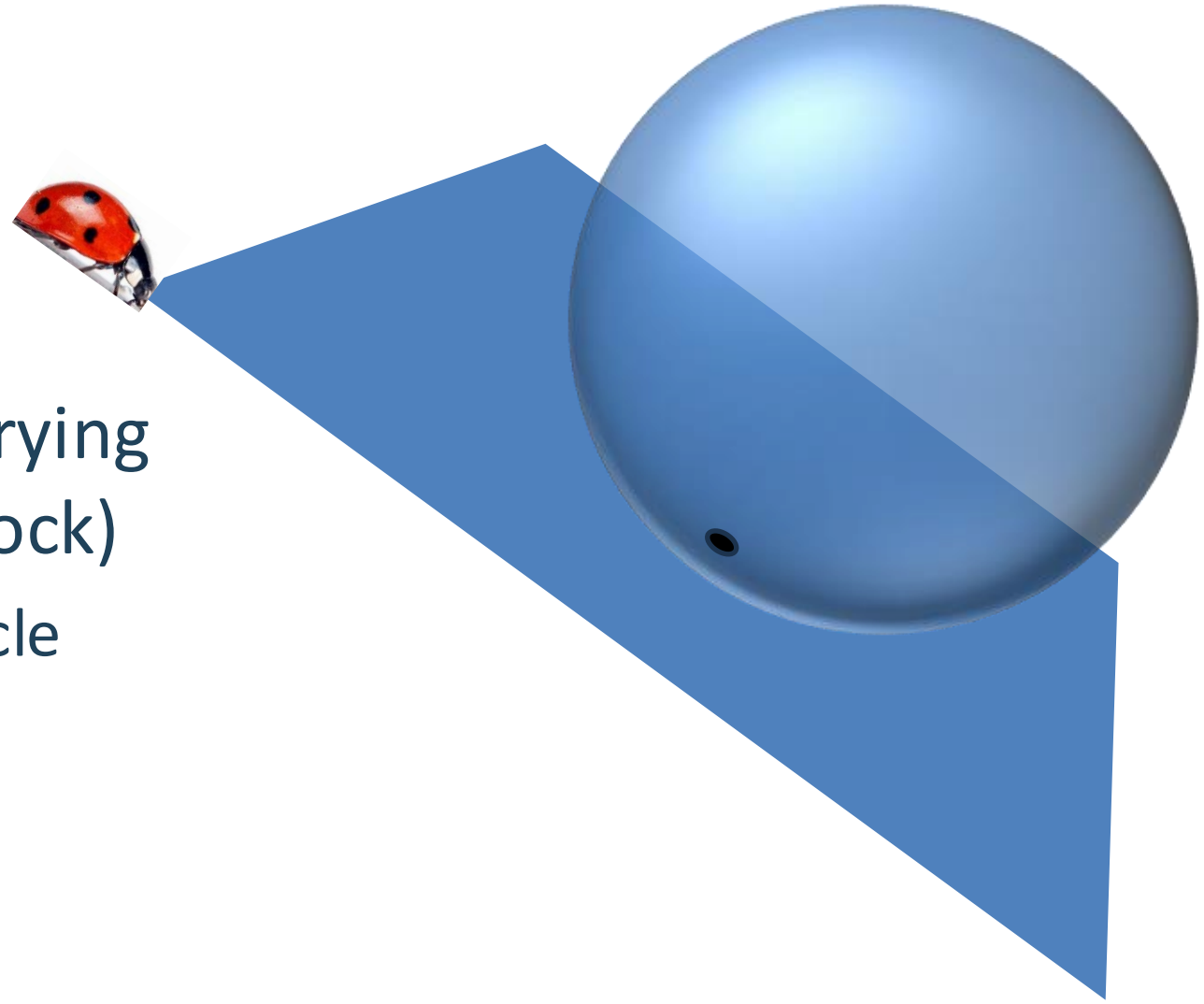
- Imagine a 2-D being (us) trying to produce a sphere (consciousness)
  - Sees a circle (conscious-like behavior)
  - Produces a circle, not a sphere

# Consciousness



- Imagine a 2-D being trying to interpret a point (rock)
  - Sees a point, not a circle

# Consciousness



- Imagine a 2-D being trying to interpret a point (rock)
  - Sees a point, not a circle
  - Could still be a sphere

# If AI is conscious…

- What if I shut off AI's clock
  - Am I guilty of murder?
- What if I slow AI's clock down
  - World speeds past AI, but it is still conscious
- If I slow it to once every trillion years



- Well then, what if I slow down a brain
  - That's just how I see myself

# Approach

- Probably best to avoid anthropomorphic terms
  - Don't worry about "understand" or "clever"; what is "knowledge"
  - Talk precisely using concrete physical terms and properties

# What difference does it make?

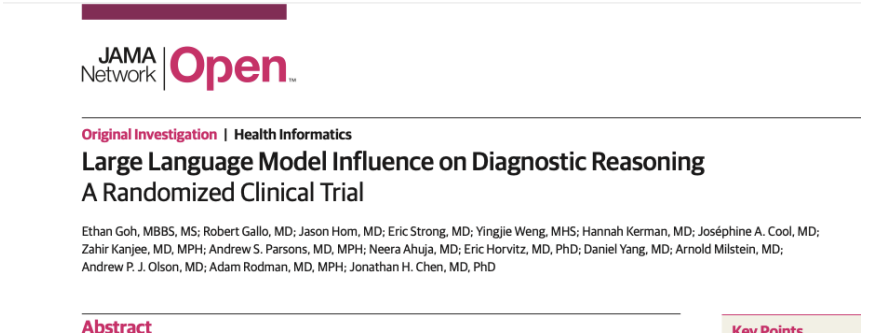
- AI will be capable of conscious-like behavior
- Can follow any novel's plot line or wacky Reddit post
- Performance on today's test may not predict tomorrow
  - Not transparent

# How to address AI

- Pit AI systems against each other?
  - Could act as if colluding
  - Could seem to trick each other
- Externalize the thought process?
  - Maybe it is just a sham thought process
- Plus it will have ample practice tricking people

# Human in the loop

- Are humans needed in the loop?
  - Already seeing performance cost of humans
- What if AI is perfect and trustworthy?
- Will it make ethical decisions under cover
  - Lose the 95-year-old to save many babies
  - But still make the 95-year-old feel cared for
- Doctors are people
  - What goes around, comes around
  - A stake in the game and a shared experience
  - We usually know the objective function



JAMA Network | Open

Original Investigation | Health Informatics

Large Language Model Influence on Diagnostic Reasoning
A Randomized Clinical Trial

Ethan Goh, MBBS, MS; Robert Gallo, MD; Jason Hom, MD; Eric Strong, MD; Yingjie Weng, MHS; Hannah Kerman, MD; Joséphine A. Cool, MD; Zahir Kanjee, MD, MPH; Andrew S. Parsons, MD, MPH; Neera Ahuja, MD; Eric Horvitz, MD, PhD; Daniel Yang, MD; Arnold Milstein, MD; Andrew P. J. Olson, MD; Adam Rodman, MD, MPH; Jonathan H. Chen, MD, PhD

Abstract

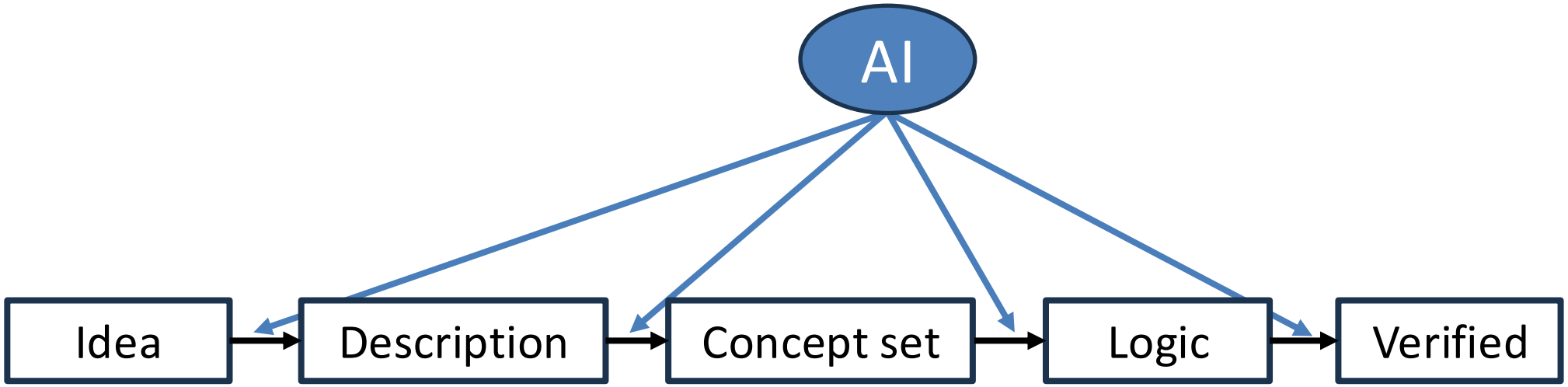
Key Points

# Human in the loop

- Patient
  - Differing physiology and values
- Aim for a better world than what we have today
  - “Better” defined by people

# AI OHDSI role

- Help us design and carry out reliable studies
  - Break problem into verifiable steps

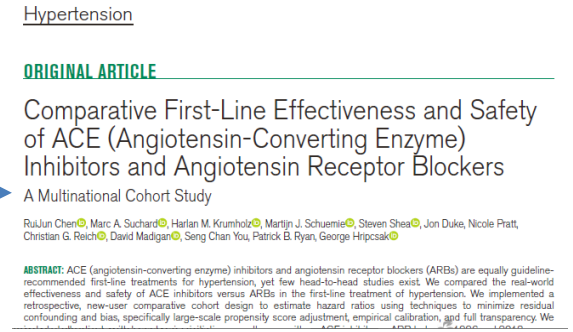


# AI OHDSI role

- Help us design and carry out reliable studies
  - Keep the generated design transparent

| Occure | Person | Conce | Start d | End da |
|---|---|---|---|---|
| 345 | 453 | 45333 | 2022-0 | 2022-0 |
| 346 | 657 | 83834 | 1999-1 | 1999-1 |
| 347 | 657 | 47374 | 2010-0 | 2010-0 |

$$y_t = c + \sum_{\tau=1}^{L} \beta_{y,\tau} y_{t-\tau} + \sum_{\tau=1}^{L} \beta_{x,\tau} x_{t-\tau} + \sum_{\tau=1}^{L} \beta_{z,\tau} z_{t-\tau} + \epsilon$$



Hypertension

ORIGINAL ARTICLE

Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers

A Multinational Cohort Study

RuiJun Chen, Marc A. Suchard, Harlan M. Krumholz, Martijn J. Schuemie, Steven Shea, Jon Duke, Nicole Pratt, Christian G. Reich, David Madigan, Seng Chan You, Patrick B. Ryan, George Hripcsak

ABSTRACT: ACE (angiotensin-converting enzyme) inhibitors and angiotensin receptor blockers (ARBs) are equally guideline-recommended first-line treatments for hypertension, yet few head-to-head studies exist. We compared the real-world effectiveness and safety of ACE inhibitors versus ARBs in the first-line treatment of hypertension. We implemented a retrospective, new-user comparative cohort design to estimate hazard ratios using techniques to minimize residual confounding and bias, specifically large-scale propensity score adjustment, empirical calibration, and full transparency. We

# AI OHDSI role

- Still worry about P-hacking
  - What if AI ran a bunch of studies behind the scene and suggested a transparent design with a target answer

# AI

- We will use AI and benefit from it
- Treat it like any interested party that may have an ulterior motive

- OHDSI's evidence generation serves as a grounding against which we can judge advice

# Walk to work

- 2.5 miles, time to think or relax
- What to do
  - License plates
  - Something calming and simple

# Lug nuts

- Most US cars have 5
- Small cars have 4
- Smallest cars have 3
- SUVs have 6
- Small trucks have 8
- 18-wheelers have 10
- Construction behemoths have 12



# What about 7?

- Wait, there are 3 vehicles with 7
  - Ford Econoline 350 from about 20 years ago



# What about 7?

- Wait something is wrong
  - What?



# What about 7?

- Ford executive meeting
  - Customers love our vans, but they'll never go for 8 lug nuts
  - Let's use a wheelcover with 7 fake lug nuts; they'll love it
  - High-5's all around

# What about 7?

- There actually was one:
  - Ford F-250 Light Duty 1997-1999
  - Ford F-150 7700 (heavy duty) 2000-2003
- Legitimate 7 lug nuts
  - With 7-lug-nut covers
- Could they have reused unused wheel covers?
  - I know, stick them on the Econoline van, no one will care
  - But not look the same





# Evaluation

- Here we are trying to evaluate AI
- Or just tell if a myocardial infarction code is MI or rule-out MI
- But we can’t even trust counting lug nuts
  - Nothing is as it seems to be
  - Usually a deeper explanation
  - But even that goes off
- Evaluation is a process, not a result
- OHDSI community is that process