

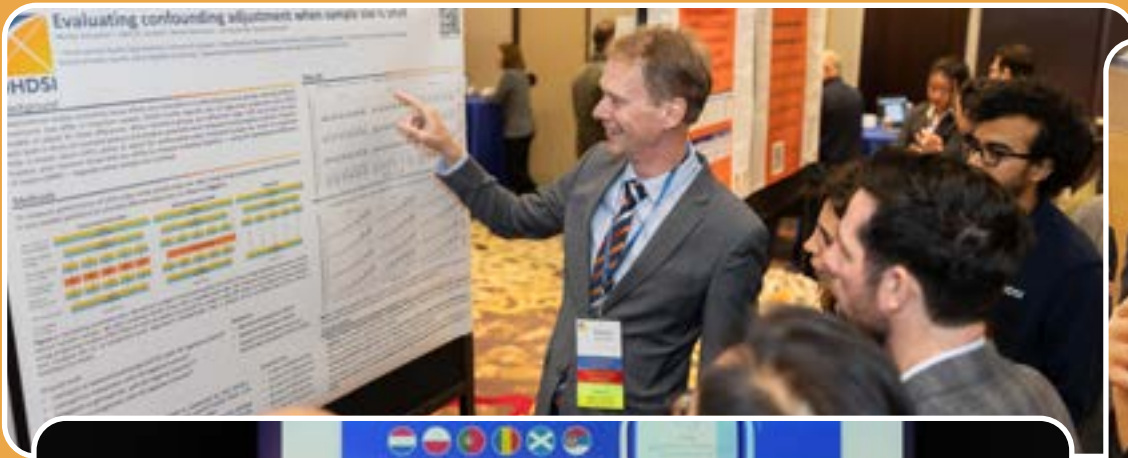
Our Journey

*Where The OHDSI Community Has Been
And Where We Are Going*
2024 edition



OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS



Publication was written and designed by Craig Sachson. Editorial assistance by Patrick Ryan, George Hripcsak, Martijn Schuemie, Marc Suchard, Jody-Ann McLeggon, Paul Nagy, Jenna Repts, Peter Rijnbeek, Clair Blacketer, Melanie Philofsky, Anna Ostropelets, Mui Van Zandt, Davera Gabriel, and other members of the OHDSI community. Photography by Craig Sachson, Glassriver Media, and others shared by the OHDSI community (unless specifically credited next to image). Printed by ABGPrint. Thank you to all members of the OHDSI community for all you have done towards improving global healthcare.



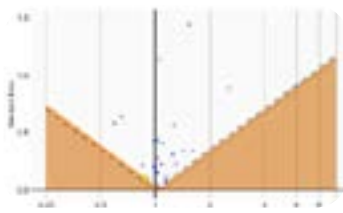
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Package Name	Version	Author	Maintainer
HADES	1.0.0
...



Similar risk of kidney failure among patients with blinding diseases who receive ranibizumab, aflibercept, and bevacizumab: an OHDSI Network Study



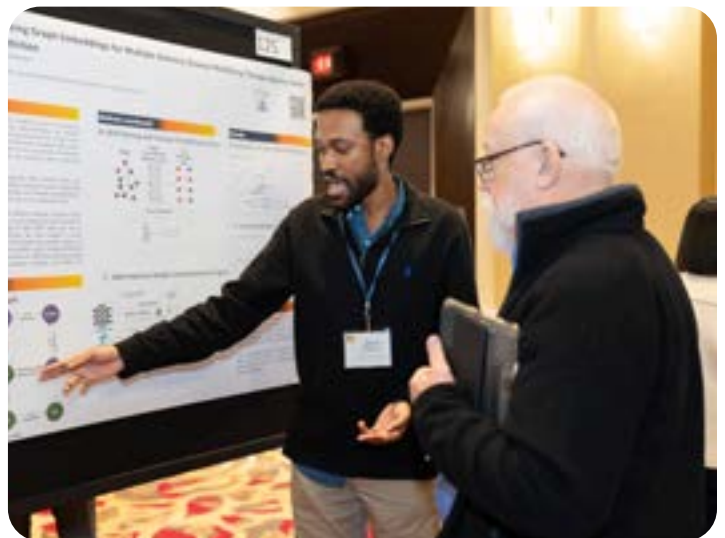


Welcome to the fourth edition of Our Journey. George Hripcsak, who leads the OHDSI Coordinating Center at Columbia University, shares this welcome letter to all members of the OHDSI community.

OHDSI reached its tenth anniversary this past year. Ten years sounds long but feels short. As a new department chair at Columbia University, I presented my five-year plan for the department, and the other chairs started laughing, saying, “yeah, that’s a ten-year plan.”

Ten years later, I remembered the meeting and looked back at my old slides, and sure enough, they were right. We did accomplish the goals, but at ten years instead of five. Five years is what it takes to look like you have accomplished something; ten years is what it takes to make a real change, especially when it concerns human behavior.

In this time, we have created a community that identifies itself as OHDSI.



WELCOME TO THE COMMUNITY



We have evolved the OMOP Common Data Model, regrouping as needed and collaborating with other standards organizations, and producing the best-known clinical data model in the world, to which over 974 million unique patients have had their data converted. Our standardized vocabularies continue to grow, keeping to its promise to exploit

other vocabularies yet filling gap where needed, such as with RxNorm Extension, and opening community contributions.

We have produced new statistical methods with proven reliability advantages and with increasing citation rates from authors who previously shied away. We have produced evidence that has affected hundreds of millions of persons in areas like COVID-19 treatment and vaccination and hypertension treatment, with publications on diabetes that stand to have a large impact, and with fast turn-around on verifying research studies in areas like ophthalmology.

We have increased our reach around the world. OHDSI has a strong presence in North America, Europe and the Asia-Pacific regions, and we have seen exciting progress in both Africa and South America.

I am told that it is very unusual for a large, funded effort like OMOP (years 2009-2013) to live beyond its funding, and OHDSI as OMOP's continuation is a rare success. OHDSI now gets its core funding from diverse sources, and the community amplifies that about ten-fold through volunteer effort. Social media startups spend money to get a foothold until they make themselves indispensable, then they cash in on revenue sources like advertising. OHDSI is not about to place ads, but has been



WELCOME TO THE COMMUNITY

working to stabilize its finances, having beneficiaries contribute to the initiative while still amplifying that investment for all OHDSI participants. OHDSI continues to seek government funding, seeing success mainly as related to its common data model. Funding its methods research and clinical studies has been spottier. Reviewers often complain that our proposals are not feasible at the scale we suggest even though LEGEND tested half a million hypotheses five years ago. They admit that our study may be more reliable than evidence currently in the literature but express concern that it still may not be perfect. And they do not particularly see a need to scale evidence generation by a thousand-fold. Therefore, selling OHDSI's vision of reliable, large-scale evidence is critical.



In the next ten years, we hope to achieve financial stability and increase trust in OHDSI. We hope to push the field to use concrete diagnostics to improve study reliability regardless of whether they use OHDSI's methods. We hope to actually increase evidence generation by a thousand-fold. Clinicians should look back at today's product labels with humor and terror, knowing that for every drug they prescribe, they can simply look at the quantified causal effect on every possible side effect and the drug's interactions with all other drugs. So-called evidence-based guidelines should actually become evidence-based rather than expert opinion laced with rare randomized trial results.

We have to work quickly, though, because ten years may sound like a long time, but it is actually quite short.

- George Hripcsak





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OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

II.

OHDSI Mission and Values



OHDSI MISSION AND VALUES

OHDSI Mission

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

OHDSI Vision

A world in which observational research produces a comprehensive understanding of health and disease.

OHDSI 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.



Observational Health Data Sciences and Informatics (OHDSI, pronounced “Odyssey”) strives to promote better health decisions and care by generating reliable evidence from standardized health data worldwide. It focuses on large-scale analytics that adhere to empirically proven methodological best practices and promotes collaboration through open science.



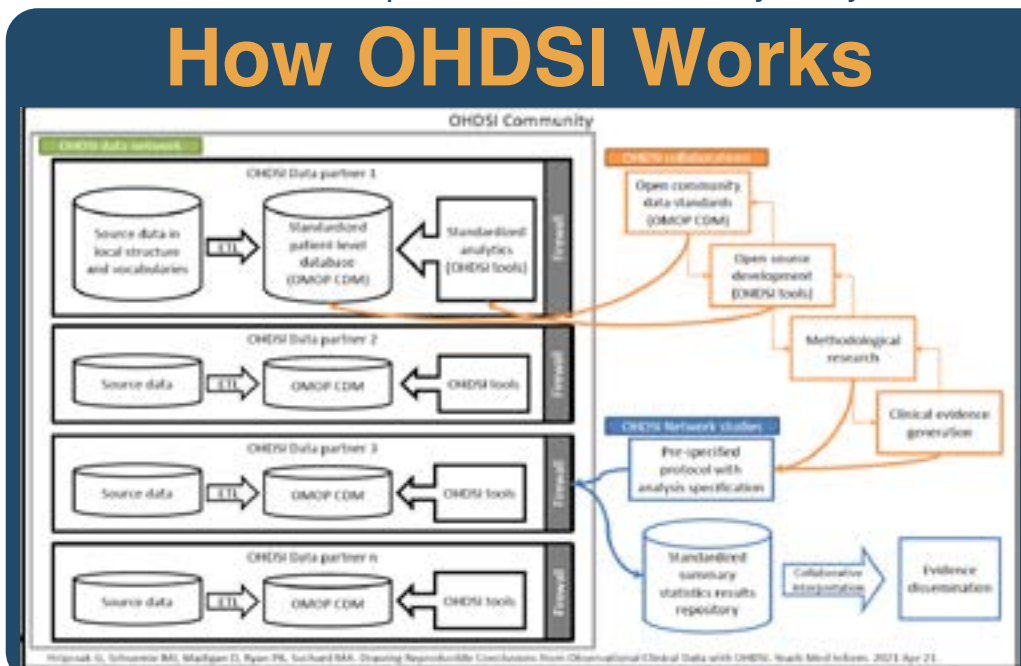
Founded in 2013, OHDSI is a growing collaborative of more than 4,200 researchers from various fields (including biomedical informatics, epidemiology, statistics, computer science, health policy, clinical sciences), representing different stakeholders (including academia, industry, government and regulatory authorities, and health providers) across 83 countries from six continents. OHDSI has created a global distributed data network that applies one open community data standard, the OMOP Common Data Model, and collectively represents more than 974 million patient records around the world. It has also developed open-source standardized analytic tools to help turn these standardized data into reliable evidence.

OHDSI collaborates to establish and evolve shared community data standards, conduct methodological research to identify and evaluate scientific best practices, develop open-source software to codify those best practices into transparent and reproducible tools, and apply these tools and practices to generate clinical evidence.

Researchers across our community conduct network studies by identifying a research question and defining protocols and analysis specifications to answer their question. Data partners across the OHDSI distributed network can opt in to execute the study analysis

package, sharing aggregated summary statistics (not individual patient data), which are then collaboratively interpreted before public dissemination. The OHDSI Evidence Network connects researchers and organizations with health data who are interested in collaborating and contributing to network studies that generate reliable real-world evidence.

How OHDSI Works



OHDSI MISSION AND VALUES

The Department of Biomedical Informatics at Columbia University (DBMI) serves as the coordinating center for the OHDSI community.

Located on the Columbia University Irving Medical Center (CUIMC) campus, DBMI is both an academic department and an information services partner to NewYork-Presbyterian Hospital, a major healthcare provider in greater New York.

One of the oldest informatics departments in the United States, faculty and students at DBMI have set the path for design of clinical information systems, methodologies in clinical natural language processing, and machine learning over electronic health record data. Faculty research includes the development and evaluation of innovative information technologies, which has led to enhancements in both health and healthcare.



Photo by Odelia Ghodsizadeh/CUIMC

Both faculty and students work in a highly collaborative environment, applying informatics from the atomic level to global populations.

DBMI is committed to carrying out rigorous and reproducible science, encouraging creativity and diversity in thought, promoting an inclusive and supportive environment, and making an impact in training, informatics research, biomedicine, and patient care.

Our global community always welcomes new collaborators. OHDSI has more than 40 workgroups and regional chapters that present opportunities for members to apply their skills and interests.

OHDSI's research has been presented across various scientific societies, such as American Medical Informatics Association (AMIA), American Statistics Association (ASA/JSM), and International Society of Pharmacoepidemiology (ISPE), and published in top medical journals, including The Lancet, JACC, JAMA, BMJ, PNAS and JAMIA. It has also informed regulatory agencies, such as the U.S. Food & Drug Administration (FDA) and the European Medicines Agency (EMA).



Please learn more about OHDSI through this publication and **Join The Journey!**



OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

III.

OHDSI Collaborators



Map of Collaborators

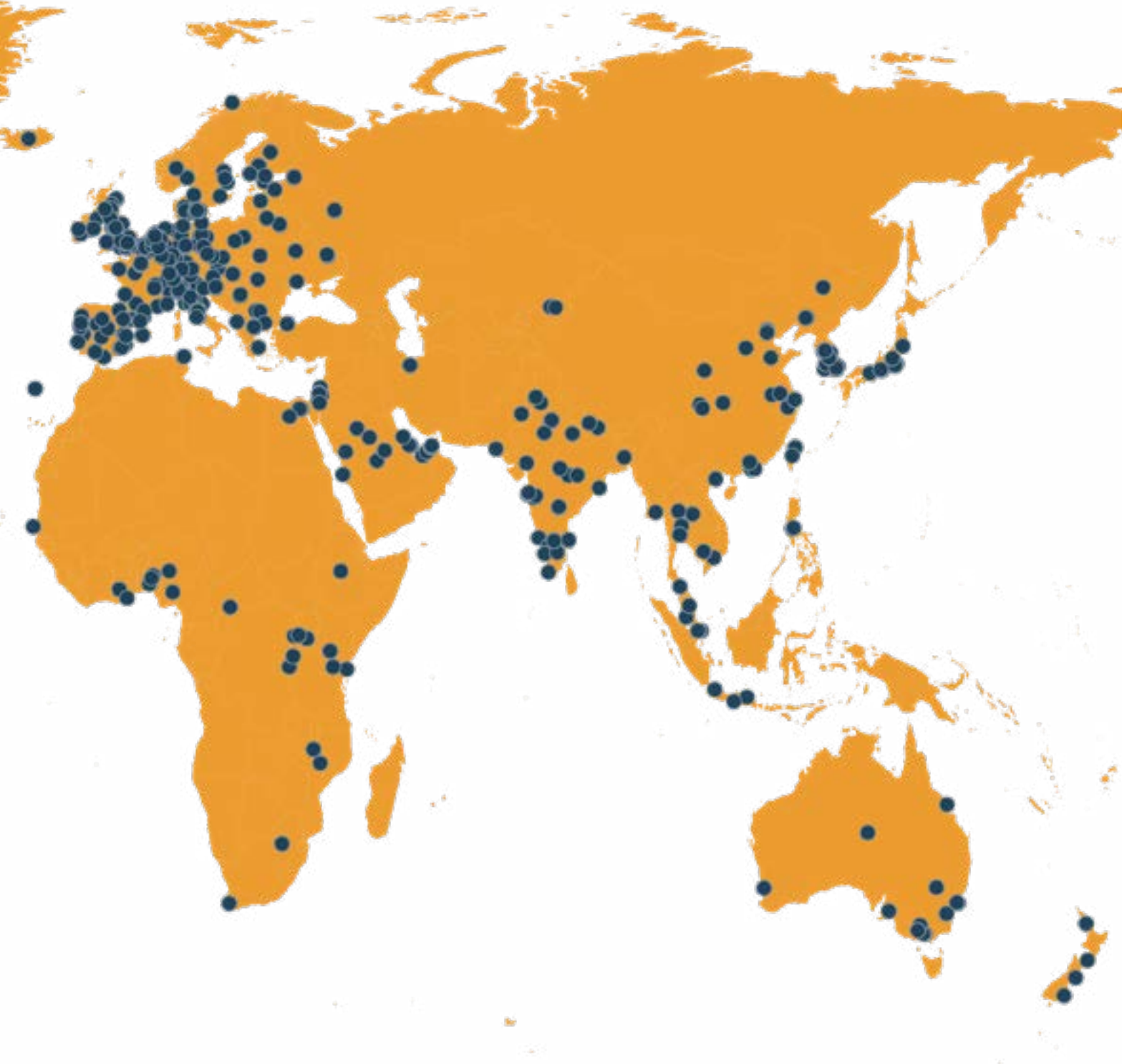
The OHDSI community brings together volunteers from around the world to establish open community data standards, develop open-source software, conduct methodological research, and apply scientific best practices to answer public health questions by generating reliable clinical evidence.



OHDSI By The Numbers

- 4,294 collaborators
- 83 countries
- 21 time zones
- 6 continents
- 1 community

Our community is ALWAYS seeking new collaborators. Do you want to focus on data standards or methodological research? Are you passionate about open-source development or clinical applications? Do you have data that you want to be part of global network studies? Do you want to join a global community that truly values the benefits of open science? Add a dot to the map below and JOIN THE JOURNEY!



























OHDSI Workgroups

OHDSI has a central mission to improve health globally, but there are countless areas where our community can be of service. Work around data, methods, open-source tools, and clinical applications are all pieces of the puzzle. Within OHDSI, there are opportunities to work in any or many of these areas.

Our 30+ workgroups, led by the extraordinary leads shown here, present opportunities for all community members to find a home for their talents and passions. Newcomers and veterans can both make meaningful contributions to our community by collaborating in workgroups. See an area where you want to contribute? Please **Join The Journey!**

www.ohdsi.org/workgroups

ATLAS		Clinical Trials			CDM Survey	
						
Christopher Knoll	Alexey Manoylenko	Anthony Sena	Mike Hamidi	Zhen Lin	Nicole Gerlanc	
CDM Vocabulary	Common Data Model	Dentistry		Early-Stage Researchers		
						
Anna Ostropelets	Clair Blacketer	Danielle Boyce	Robert Koski	Faaizah Arshad	Ross Williams	
Electronic Animal Health Records		Eye Care and Vision Research			FHIR and OMOP	
						
Manlik Kwong	Wayde Shipman	Sally Baxter	Kerry Goetz	Michelle Hribar	Davera Gabriel	
FHIR and OMOP		Gen. AI & Analytics	GIS - Geographic Information System			
						
Ben Hamlin	Guy Tsafnat	Martijn Schuemie	Robert Miller	Andrew Williams	Kyle Zollo-Venecek	

OHDSI COLLABORATORS

HADES		Health Equity		Healthcare Systems		Industry		Medical Devices									
																	
Martijn Schuemie		Atif Adam		Melanie Philofsky		Paul Dougall		Sarah Seager		Asiyah Lin							
Medical Imaging			Methods Research			Natural Language Processing (NLP)											
																	
Paul Nagy			Seng Chan You			Martijn Schuemie			Marc Suchard			Vipina Keloth			Hua Xu		
Network Data Quality		Oncology		Open-Source Community		Patient-Level Prediction (PLP)											
																	
Clair Blacketer		Asieh Golozar		Adam Black		Paul Nagy		Jenna Reps		Ross Williams							
Perinatal and Reproductive Health				Phenotype Development & Evaluation		Psychiatry											
																	
Alison Callahan		Stephanie Leonard		Louisa Smith		Gowtham Rao		Azza Shoaibi		Dmytry Dymshyts							
Psychiatry		Registry		Rehabilitation		Steering											
																	
Andrew Williams		Tina Parciak		Esther Janssen		Ruud Salles		George Hripcsak		Patrick Ryan							
Surgery and Perioperative Medicine			Themis		Vaccine Vocabulary			OHDSI Workgroups Homepage									
																	
Jenny Lane		Evan Minty		Melanie Philofsky		Oliver He		Asiyah Lin									



Regional Chapters

OHDSI spans 83 nations and six continents, and we collaborate with the intention of building one global community. However, we recognize that many geographic areas often face their own specific challenges. Several teams — both regional chapters and workgroups — have been formed to address these issues, as well as hold networking events and meetings, lead regional studies, and help their regions become valuable collaborators within our universal mission.

Several new regional chapters have been formed over the last three years, including Africa and India. We are excited to see OHDSI enthusiasm spread throughout the world. Thank you to the local leads who bring our community message into different regions of the world.

Africa



Agnes Kiragga

Asia-Pacific (APAC)



Cynthia Sung



Mui Van Zandt

Australia



Nicole Pratt

China



Hua Xu

Europe



Peter Rijnbeek

India



Swetha Kiranmayi Jakkuv



Vikram Patil



Parthiban Sulur

Japan



Tatsuo Hiramatsu

Latin America



Jose Posada

Republic of Korea



Rae Woong Park

Singapore



Mengling 'Mornin' Feng

Taiwan



Jason Hsu

Europe National Nodes

Over the last two years, OHDSI Europe developed National Nodes, which are collections of research institutions within a member country. The Nodes include a broad range of member groups, ranging from research institutes, pharmaceutical and IT companies, and SMEs. They are generally led by academic institutions and are inclusive and open to any organization that wants to share experiences with OHDSI-related work, such as mapping data to the OMOP Common Data Model or performing network studies.

As of September 2024, there are 14 National Nodes, representing 700 members and over 100 data sources.

Node..... Lead(s)

Belgium	Liesbet Peeters, Annelies Verbiest, Ilse Vermeulen
Denmark	Ismail Gögenur, Martin Høyer Rose, Andreas Weinberger Rosen
Estonia	Raivo Kolde, Sulev Reisberg
Finland	Eric Fey
Germany	Ines Reinecke, Michele Zoch
Greece	Anastasia Farmaki, Pantelis Natsiavas, Grigoris Papapostolou
Israel	Chen Yanover
Italy	Lucia Sacchi, Matteo Gabetta
Luxembourg	Claudine Backes, Andreas Kremer, Maria Quaranta
Netherlands	Renske Los, Aniek Markus
Norway	Espen Enerly, Siri Larønningen
Portugal	Patricia Couceiro, Carmen Nogueira
Spain	Miguel Angel Mayer, Talita Duarte Salles
United Kingdom	Dani Prieto-Alhambra



National Nodes leads met together during the 2024 Europe Symposium.

EHDEN Celebrates Milestone

EHDEN — the European Health Data & Evidence Network — was launched to address the current challenges throughout Europe of generating insights and evidence from real-world clinical data at scale. Building on OHDSI tools and practices, EHDEN developed a public-private consortium consisting of 25 organizations that successfully implemented its mission: *to provide a new paradigm for the discovery and analysis of health data in Europe, by building a large scale, sustainable federated network of data sources standardised to the OMOP common data model.*

EHDEN’s five-year IMI 2 phase ends in 2024, and the program will now transition into the EHDEN Foundation, a long-term, sustainable operation that will continue to promote and foster a strong and growing open science community, supporting studies, studyathons, methodological and technical developments, and research programmes.

OHDSI congratulates all involved with the EHDEN project on a successful first five years, and looks forward to many more years of productive collaboration ahead.

The EHDEN Data Network

After seven open calls and more than 500 applications, **187 data partners from 29 countries** were granted financial support to map their data to the OMOP CDM. This data network is now being used for large network studies in EHDEN, the EHDEN Foundation, OHDSI, and other initiatives. **64 small-to-medium enterprises (SMEs) from 22 countries** completed certification and received the seal to help data partners map their data to the OMOP CDM and install the necessary tools.



25 partners **12** nations



DARWIN EU®

The European Medicines Agency (EMA) and the European Medicines Regulatory Network established a coordination centre to provide timely and reliable evidence on the use, safety and effectiveness of medicines for human use, including vaccines, from real world healthcare databases across the European Union (EU). This capability is called the Data Analysis and Real World Interrogation Network (DARWIN EU®).

The DARWIN EU® data network currently includes 20 data partners across 13 nations — comprising more than 143 million patients — that have been mapped to the OMOP common data model. Multiple OHDSI Titan Award winners can be found leading the DARWIN EU® coordination centre, and many OHDSI tools, methods and practices are present in completed and ongoing studies.

Studies

Category	Description
Off-The-Shelf Studies	These are mainly characterisation questions that can be executed with a generic protocol. This includes studies on disease epidemiology, for example the estimation of the prevalence or incidence of health outcomes in defined time periods and population groups, or drug utilization studies at the population or patient level.
Complex Studies	These are studies requiring development or customisation of specific study designs, protocols, analytics and phenotypes. This includes studies on the safety and effectiveness of medicines and vaccines.
Routine Repeated Analyses	Routine analyses based on Off-The-Shelf or Complex Studies (see above), which are repeated with a pre-specified regularity (e.g. yearly)
Very Complex Studies	Studies which cannot rely only on electronic health care databases, or which require complex and/or novel methodological work

DARWIN EU® Leadership



Peter Rijnbeek
Erasmus MC

Executive Director,
Technology
Pillar Lead



Dani Prieto-Alhambra
Erasmus MC,
Oxford University

Deputy Director,
Development
Pillar Lead



Katia Verhamme
Erasmus MC

Deputy Director,
Study Operations
Pillar Lead



Carlos Diaz
Synapse Research
Management Partners

Management
Pillar Lead



Maxim Moinat
Erasmus MC

Network Operations
Pillar Lead

US FDA CBER BEST Initiative

Researchers within the OHDSI community currently provide support to the U.S. Food and Drug Administration (FDA) Biologics Effectiveness and Safety (BEST) Initiative in its mission to conduct safety and effectiveness surveillance of biologic products (vaccines, blood and blood products, tissues and advanced therapeutics).

Specific means of FDA support through this grant include serving in a convening role to 1) develop methods related to using observational data from electronic health records and administrative claims to study the effectiveness and safety of biologics, 2) work collaboratively with FDA staff to plan, develop, coordinate, host and convene meetings and workshops, and 3) educate FDA staff and external stakeholders on the BEST infrastructure, capabilities, and applications that serve FDA and stakeholder needs.

Vaccine Surveillance Methods Research



CBER Best Seminar Series

The CBER BEST Initiative Seminar Series is designed to share and discuss recent research of relevance to ongoing and future surveillance activities of CBER regulated products. The series focuses on safety and effectiveness of biologics including vaccines, blood components, blood-derived products, tissues and advanced therapies.

The seminars provide information on characteristics of biologics, required infrastructure, study designs, and analytic methods utilized for pharmacovigilance and pharmacoepidemiologic studies of biologics. They also cover information regarding potential data sources, informatics challenges and requirements, utilization of real-world data and evidence, and risk-benefit analysis for biologic products.

Seminars from 2024 are listed below. Use the QR code to visit the seminar homepage and learn about upcoming talks or watch previous sessions.

Title: Observational methods for COVID-19 vaccine effectiveness research: an empirical evaluation and target trial emulation

Presenter: Martí Català Sabaté, Medical Statistician and Data Scientist, University of Oxford

Title: A modified self-controlled case series method for event-dependent exposures and high event-related mortality, with application to COVID-19 vaccine safety

Presenter: Yonas Ghebremichael-Weldeselassie, Lecturer of Statistics at School of Mathematics and Statistics, The Open University, UK

Title: Applying Machine Learning in Distributed Networks to Support Activities for Post-Market Surveillance of Medical Products: Opportunities, Challenges, and Considerations

Presenter: Jenna Wong, Assistant Professor in the Department of Population Medicine at Harvard Medical School and Harvard Pilgrim Health Care Institute

Title: Reliability in Observational Research: Assessing Covariate Imbalance in Small Studies

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

Title: Real-World Effectiveness of BNT162b2 Against Infection and Severe Diseases in Children and Adolescents: causal inference under misclassification in treatment status

Presenter: Yong Chen, Professor & Director of the Center for Health AI and Synthesis of Evidence (CHASE) at the University of Pennsylvania

Title: KEEPER: Standardized structured data from electronic health records as an alternative to chart review for case adjudication and phenotype evaluation

Presenter: Anna Ostropelets, Director, Head of Innovation Lab, Odysseus Data Services

CBER Seminar Series Homepage



Support The Journey

The OHDSI community comprises a global team of volunteers who collaborates together using open-source tools and shares 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. This program allows 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.

How does the Coordinating Center support OHDSI?

- Provides central shared infrastructure and coordinates community activities to enable community 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

Coordinating Center Responsibilities

Steward open community data standards

- vocabularies
- OMOP CDM
- support adoption in large multi-center initiatives
- foster external collaborations (HL7)

Enable open-source development

- host servers to enable development and continuous tool testing
- GitHub repo support
- support ATLAS demo
- create central infrastructure

Facilitate methods research & clinical applications

- host ATLAS collaboration environment
- support Evidence Network and ongoing network studies
- lead studies and develop tools

Encourage open sharing & evidence dissemination

- host OHDSI RShiny servers for open sharing of results (more than 230 Shine applications, including LEGEND)
- built results.ohdsi.org

Foster collaboration & empower community

- host and fund annual Global Symposium
- maintain forums, MS Teams
- facilitate weekly community calls, website, all other communications

Coordinating Center Costs: >\$1M annually

Organizations Involved With OHDSI

OHDSI is a global community of collaborators. Many of the individuals represent organizations who contribute to and benefit from their participation in the OHDSI community. OHDSI is proud to collaborate with the more than 1100 organizations listed below, and looks forward to other organizations joining the journey as well.

2Ca-Braga • Aarhus University • Abbott • AbbVie • Academy of Nutrition and Dietetics • Accenture • ACEP • Actelion Pharmaceuticals Ltd. • Acumen Analytics, Inc. • Aditya Birla Health Services Pvt Ltd • Advantmed India LLP • Advocate Aurora Health • Aetion • Affinity Networks, Inc. • Africa Institute for Health Policy • African Population and Health Research Center • Aga Khan University Hospital • Agenzia Di Tutela Della Salute Della Provincia Di Bergamo • AHRI • Ainigma Technologies • Airlangga University • Ajou University Hospital • Akvria Health • Albany College of Pharmacy and Health Sciences • Albert Einstein Hospital • Alberta Health Services • Alexion Pharmaceuticals • All Of Us Research Program • Allscripts • Altera Health • AMC Medical Research BV • American Academy of Neurology • American Academy of Ophthalmology • American College of Radiology • American Thrombosis and Hemostasis Network • Americas Medical Services / UHG Brazil • Amgen Canada Inc. • Amgen Inc • Amphora Health • Amsterdam UMC • Ancora • Andalusian Health Service • Andrija Štampar School Of Public Health • Annexus Health • Answer Digital • Anthem • AOTMIT • AOU Meyer IRCCS • APDP Diabetes Portugal • Apervita • AP-HM • AP-HP, INSERM, Sorbonne University • APHRC • Aptive Resources • Arcadia Inc • Architectural Medicine LLC • ARDC • Aridhia Informatics Ltd • Arizona State University • arkhn • ARS Toscana • Artexe S.p.A. • Asan Medical Center • ASCO CancerLinQ • Asociación Instituto De Investigación Sanitaria Biocruces Bizkaia • Assistance Publique - Hopitaux De Paris / Aphp • Assistance Publique Hopitaux De Marseille • Association EISBM • ASTAR SICS • Astellas Pharma • AstraZeneca • ASU • Athenahealth • Atrium Wake Forest Baptist Health • AU-EPBRN • AUNA • Auria Tietopalvelu / Varsinais-Suomen sairaanhoitopiiri • AUS Dept of Veterans Affairs • Ausl parma • AUSL Reggio Emilia • AUSL-IRCCS di Reggio Emilia • Austin Health • Avenga • AWS • Axiomedix • Az Damiaan • AZ Delta • Az Klina • AZ Maria Middelares • Azienda Ospedaliera di Parma • Azienda Ospedaliera Nazionale Ss. Antonio E Biagio E Cesare Arrigo Alessandria • Azienda Ospedaliera Universitaria (Aou) Di Modena • Azienda Ospedaliera Universitaria Verona • Azienda Ospedaliero-Universitaria di Parma • Azienda Unità Sanitaria Locale-Irccs In Reggio Emilia • B2I Healthcare • Bahia Software • Bahir dar University • Balkh University Family of Medicine • Bambino Gesù Children's Hospital • Baroda Medical College, India • Barts Health NHS Trust • Baxter • Bayer AG • Baylor College of Medicine • Baylor Scott and White Health • BC Platforms • BCB Medical Oy • Beijing Safe House • Bendigo Health • Ben-Gurion University • Berlin Institute of Health • BI Pharma • Bill & Melinda Gates Foundation • Biogen • Bioinformatics Institute • BioSci Consulting • BioT • Boehringer Ingelheim Pharmaceuticals Inc. • Bonadt • Booz Allen Hamilton • Bordeaux Hospital • Boston Medical Center • Boston University • Bradford Teaching Hospitals NHS Foundation Trust • Brazilian MOH • Brigham and Women's Hospital • Bristol-Myers Squibb • Brown Center for Biomedical Informatics • Brown University • BSMU • Bucheon Hospital • Buddhimed Technologies • Caliber • Campbell University School of Osteopathic Medicine • Canadian Institute for Health Information • Cancer Registry of Norway • Cancer Treatment Centers of America • Cancerdatanet GmbH • Canterbury Christ Church University • Caggemini • Cardiff University • CareDx • Careggi University Hospital • CareQuest Institute for Oral Health • Carilion Clinic • Carnegie Mellon University • Carnegie Mellon in Qatar • Casa di Cura Privata del Policlinico • Case Western Reserve University • Catholic University of Korea Seoul St. Mary's Hospital • Catholic University of Korea Yeouido St. Mary's Hospital • CBWCHC • CCHO FZ LLC • CDPHP • Cedars-Sinai Medical Center • Cegedim Health Data • Center for Surgical Science Zealand University hospital Denmark • Centers for Disease Control and Prevention • Central South University • Centre for Big Data Research in Health, UNSW • Centre for Health Analytics, Melbourne Children's Campus • Centre for Health Informatics, University of Calgary • Centre for Prevention of Stroke and Dementia, Nuffield Department of Clinical Neurosciences, University of Oxford • Centre Hospitalier Universitaire De Lille • Centre Hospitalier Universitaire De Toulouse • Centro Clinico Champalimaud • Centro de Hemoterapia y Hemodonacion de Castilla y Leon • Centro Hospitalar e Universitário de Coimbra • cepobia • Cerner • Cerner Enviza • CGD HEALTH PTY LTD. • CH ACTL EPIDEMIOLOGY • Cha University Bundang Medical Center • Charité - Universitätsmedizin Berlin • CHCO (USA) • Cherokee Health Systems • Chevron Health and Medical • Children's National • Childrens Clinical University hospital • Children's Hospital Colorado • Children's Hospital of Philadelphia • CHLA (USA) • Chonnam National University Hospital • Christe • CHU Montpellier • CIDACS - Centre for Health Data Integration and Knowledge • Cidacs/Fiocruz • Cidacs-IGM-Fiocruz • CIHI • Cincinnati Children's Hospital Medical Center • CINTESIS • CIPHEROME, Inc. • City Credit Capital UK Ltd. • Cityblock Health • Claffin University • Claim Clarity • Clarivate Analytics • Clemson University • Clinica Alemana de Santiago • Clinical Architecture • Clinical Center of Serbia • Clinical Centre of Nis • Clinical Data Interchange Standards Consortium (CDISC) • Clinical Practice Research Datalink (CPRD) • Clinical Study Support, Inc. • Cloud Senang • Cobracom, LLC • Cochrane Singapore • CODATA • Cognizant • collaborate.eu • College of Science & Technology • Columbia University • Columbia University Irving Medical Center • Comac-Medical • CommonSpirit Health • Community Pharmacy • Consentimento • ConcertAI • ConvergeHEALTH by Deloitte • Cooperative Health • Copperline Professional Solutions / Renaissance Computing Institute, UNC Chapel Hill • Cornell University • Covance • COVARIANCE P.C. • Covera Health • CPRD • CRHFEI • Critical Path Institute • CRO Aviano • Croatian Institute of Public Health • Cultural Agents • CurriMeta, Inc. • cwwdata • D'Inves72tigacions Mèdiques • D4L data4life gGmbH • Daccude • Daegu Catholic University Hospital • Daiichi Sankyo Europe GmbH • Dana-Farber Cancer Institute • Danylo Halatsky LNMU • Dartmouth Health • DATA • Data Analytics Centre • Danish Medicines Agency • Data Integration Centre University Hospital Carl Gustav Carus Dresden • Data InterOps • Data4Life • Databricks • DataRiver S.r.l. • Datasus Ambulatory • David Griffin School of Medicine at University of California, Los Angeles • De La Salle University • Dedalus • DeepthinkHealth Inc • Defense Health Agency • Delft University of Technology • Dell Medical School • Deloitte Consulting LLP • Democritus University of Thrace and Athens Research Center • Department of Preventive Medicine, Yonsei University • DFCI • DHC • DHS Los Angeles • Digital China Health Technologies Company (China) • Digital Health China Technologies Co., LTD • Digital Scientists • Digulab Ltd. • DKW • DNAnexus • Doctors with Africa • Dongguk University Ilsan Hospital • Dresden University Of Technology • DRG • Drug Safety Research Unit • DS-I Africa: eLwazi (Open Data Source Platform) based at University of Cape Town • Duke Clinical Research Institute • Duke University • Duke-NUS Medical School • EAU • Eau Claire Cooperative Health Center • EBMT (EU) • edenceHealth NV • Edinburgh Cancer Centre • EGCUT • EHDEN • Einstein College of Medicine • EISBM • El Camino Health • Elevance Health • Eli Lilly & Company • Elmergib University • Elsevier • Emory University • Epirh, Inc • Epic Systems • Equipe Zorgbedrijven • Erasmus MC • Erasmus University Medical Center • Eric Cox Consulting LLC • Essex Management • European Health Management Association, Westminster University in Tashkent • European Medicines Agency • Evidentii Pty Ltd • Evidera • Evidnet • Ewha Womans University Mokdong Hospital • Exactis Innovation • Excelra • F. Hoffmann-La Roche AG • Fairview Health Services • Federal University of Santa Catarina • FeelBetter • FemTec Health Inc. • FIBH120 • FIIBAP • FinnGen • Finnish Cancer Registry • Finnish Institute of Health and Welfare • Fiocruz • Fisicaid • FITec • Flatiron Health • Fondazione IRCCS Ca' Granda Ospedale • Fondazione IRCCS Istituto Nazionale Dei Tumori • Fondazione IRCCS Istituto Neurologico Carlo Besta • Fondazione IRCCS Policlinico San Matteo • Fondazione Poliambulanza • Fondazione Toscana Gabriele Monasterio • Foundation for Advancing Science, Technology, Education and Research (FASTER) • Fourier Intelligence • Fraunhofer Institute for Digital Medicine MEVIS • Fred Hutch Cancer Center • Freenome • Freyr Ltd • Fudan University • Fujitsu • Funcional Health Tech • Fundacio Institut • Fundación Rioja Salud • FUS • G42 Healthcare • GA4GH • Gacheon Gil Hospital • Gangbuk Samsung Hospital • Gangdong Sacred Heart Hospital • Gangnam Severance Hospital • Gastro Health • Gates Medical Research Institute • Gates Ventures • GE Healthcare • Gedeon Richter Plc. • Geisinger • Genentech • General Hospital Of Kavala • Geneva Tumor Registry, University of Geneva • Genome BC • Genomics England • George Mason University • George Washington University • Georgetown • Georgia Institute of Technology • Georgia Tech • Georgia Tech Research Institute • Gerencia Asistencial Atención Primaria Madrid • German Center for Diabetes Research (DZD) • Germantown Academy • Getrude's Children Hospital • Gilead Sciences • GlaxoSmithKline • Global Value Web Technologies Pvt. Ltd. • Glismed Learning Health • GMCK • Google • Gotthardt Healthgroup AG • Government of the Northwest Territories • Gray & Associates • Great Ormond Street Hospital NHS Foundation Trust • GRUPO AUNA • Gunma Kokusai Academy • GVW technologies • H2O.ai • Hackensack Meridian Health • Hainan Institute of Real World Data • Hallym University College of Medicine • Hamad Medical Corporation Ambulance Service • Hanover Medical School (Germany) • Hanyang University Hospital • Hartford HealthCare • Harvard Medical School • Harvard Pilgrim Health Care Institute • Harvey Walsh Ltd • Hasselt University • Haute Autorité de Santé • HCSC • HD Labs (Hilltop Digital Lab Ltd) • HDR UK • Health Compiler Inc • Health Data Research UK • Health Insurance Review and Assessment Service • Healthark Insights • Healthcare Innovation Catalysts • Healthcare Triangle Inc • Healthcare • HealthPartners • HealthVerity • Hebei Mental Health Center • Heliant Ltd • Helix • Helix Biogen Institute • Helsinki University Hospital • Helwan University • Hengru Pharmaceutical • Hennepin Healthcare Research Institute • Herbarium • Hierarchia D.O.O. On Behalf Of University Hospital Centre Zagreb • HIKE HEALTH • Hilltop Digital Lab Ltd • Himformatics • Hinge Health • HITLAB • HKU • HL7 • HM Hospitals • HMAI • HMAR • Holmusk • Holon Institute of Technology • Hopital Universitaire de Bruxelles - Institut Jules Bordet • Hopsital Universidad Del Norte • Horiana • Hospital Authority • Hospital District Of Southwest Finland (Varsinais-Suomen Sairaanhoitopiiri) • Hospital do Espírito Santo de Évora • Hospital Israelita Albert Einstein • Hospital U. Fundación Alcorcón • Hospital Universitario 12 de Octubre • Hulafe (Spain) • Humana • Humanitas Mirasole s.p.a. • Humanized Health Consulting, LLC • Hus Datalake Ecareforme POC • Hwasun Chonnam National University Hospital • IBM T.J. Watson Research Center • Icahn School of Medicine at Mount Sinai • ICIFE • ICON • ICVS (Portugal) • IDIAP Jordi Gol • Idisba • Idival • iHealth Data Sciences LLC • IHHN • IIAS • IIHMR, Bangalore • IIIT Guwahati • IISER • IKNL • Imam Abdulrahman Bin Faisal University • IMASIS • IME • Imosphere Ltd • Imperial College London • Imperial College Of Science Technology And Medicine • INABICERTH • Incheon Sejong Hospital • InCRyptable Consulting Group • Independence Blue Cross • Indian Society for Clinical Research • Indiana University School Of Medicine • Indiana University, Indianapolis • Infinite Computer Solutions • Infosys Limited • Inha University Hospital • Inje University Seoul Paik Hospital • INKL • innovaccr • Innovative Medical Research SA • Inova Health • Insight Health • INSPIRE EAST

AFRICA • Institute for Evidence-Based Health (ISBE) • Institute for Implementation Science and Health • Institute for Medical Research/Durham VA • Institute of Applied Biosciences, Centre for Research and Technology Hellas • Institute of Medical Bioinformatics and Systems Medicine • Instituto de Investigacion Hospital 12 de Octubre • Int'l Uni of Health And Welfare • Integra Connect • Integraal Kankercentrum Nederland • Intermountain Healthcare • International Society for Pharmacoeconomics • International University of Health and Welfare • InterSystems • IOMED Medical Solutions • IPRO • IQVIA • IRCCS Azienda Ospedaliero-Universitaria di Bologna • IRCCS Istituto Romagnolo per lo Studio dei Tumori (IRST) • IRCCS Policlinico San Donato • IRCCS San Matteo Pavia • IRST (Italy) • ISBST & National School of Computer Sciences, Tunisia • Islamia University of Bahawalpur • Istanbul University Istanbul Faculty of Medicine • Istanbul University-Cerrahpasa • Istituto nazionale dei tumori • ISU • Italian College of General Practice and Primary Care (SIMG) • ITClinical • ITTM S.A. • J. Craig Venter Institute • Jackson Laboratory • Jacobi Medical Center • Janssen Pharmaceuticals • Janssen Research & Development LLC • Jayne Koskinas Ted Giovanis Foundation • Jiangxi Province • JIBB Enterprises LLC • Johns Hopkins School of Medicine • Johns Hopkins University • Johns Hopkins University School of Medicine • Johnson & Johnson • Joint Clinical Research Centre • JSS Academy of Higher Education & Research, Mysuru • Juntendo Uni SOM • Kabale University • Kainos • Kaiser • Kaiser & Preusse • Kaiser Permanente Riverside Medical Center • KAIST • Kangwon National University Hospital • Karolinska Institutet • KAUST • Keio University • Kent and Medway Medical School • Khoo Teck Puat Hospital • KI Research Institute • Kilimanjaro Christian Medical University College of Management and Development for Health • Kilimanjaro Clinical Research Institute • King Abdulaziz University • King Saud University Medical City • King's College London • Kliničko-Bolnički Centar Zvezdara • Knight Cancer Institute • Koc University • Konkuk University Hospital • Konyang University Hospital • Kootenai Health • Korea Advanced Inst of Sci and Tech • Korea University Anam Hospital • Korea University Ansan Hospital • Korea University Guro Hospital • Korle Bu Teaching Hospital • Kyoto University • Kyunghee University Hospital • Kyungpook National University Hospital • Kyushu University Hospital, Japan • La Trobe University • Lancashire Teaching Hospitals NHS Foundation Trust • LBI Digital Health and Patient Safety • Lean Business Services • Leeds Teaching Hospitals NHS Trust • Leiden MC • Leukemia and Lymphoma Society • Lifebit • Lifeline • LIH (Luxembourg) • Limics • LinkDoc • LMU Munich University Clinic • LMU of Munich • Loma Linda University • Los Angeles County Department of Health Services: Women's Health Innovation • Loyola University (NOLA) • LSHTM • LTS Computing LLC • Lund University • Lundbeck • Lynxare Clinical Informatics NV • M2GEN • Maastricht University Medical Centre • Maggiore Policlinico • Mahidol University • Maine Medical Center Research Institute • MaineHealth • Management Sciences for Health • Manipal college of Pharmaceutical Sciences, MAHE • Marina Salud S.A. • Mass General Brigham • Mathematica • Mayo Clinic • McGill University • MCRI • MD Partners, Inc. • MDV (Japan) • MEMB CARE • Medaman BV • Medcase • Mederata Inc • Medexprim • Medibloc • Medical College of Wisconsin • Medical Device Innovation Consortium (MDIC) • Medical Engineering Institute, Inc. • Medical University of Graz • Medical University of South Carolina • Medical University of Vienna • Medicalscan Ltd • MedMana • medondo • MedStar Health Research Institute • Meharry Medical College • Melbourne University • Memorial Sloan Kettering Cancer Center • Merative • Mercer • Merck & Co. • MGH/MGB CHORUS • Michigan Department of Health and Human Services • Michigan Medicine • Microsoft Corporation • Military University Of Technology • Minderoo Foundation • Ministry Of Health Singapore • Minneapolis VAMC • Misofino • MIT • MITRE Corporation • MITYUNG INFOTECH (P) LTD. • MLCommons • Moffitt Cancer Institute • Moh • Momentum AD • Monash University • Monash University Malaysia • Montefiore Health System • Mount Sinai School of Medicine • Mountains of the Moon University • Moxe Health • MS Forschungs- und ProjektentwicklungsgGmbH • MS Urban Research Center • MSD • MSFP-gGmbH • MTG Research and Development Lab • MTPPI • MU Vienna • Murdoch Children's Research Institute • Myongji Hospital • Myriad Genetics Inc • NACHC • Nanfang Hospital • Nanjing Audit University • Nanjing Medical University • Nanyang Technological University • NATGO DATA GROUP, INC • National and Kapodistrian University of Athens • National Cancer Center • National Cancer Center Hospital East • National Cancer Hospital East • National Cancer Institute • National Center for Advancing Translational Sciences (NCATS) • National Health Insurance Corporation Ilan Hospital • National Institute Health Research UK • National Institute of Public Health (Japan) • National Marrow Donor Program • National Organization of Rare Disorders • National University of Hospital (SG_NUH) • National University of Singapore • Navigating Cancer • NCCA • NEC SWS • Nemours • NeoGenomics • NESTcc • Netherlands Comprehensive Cancer Organisation (IKNL) • Network Health • network.bio • New York Genome Center • New Zealand Ministry of Health • NextGen Healthcare • NHIRD • NHMRC Clinical Trials Centre, University of Sydney • NHS • NICE • Nicklaus Children's Health System • NIH All of Us Research Program • NIP • NJ Department of Health • Northeastern University • Northeastern University - Roux Institute • Northshore University Health System • Northside Hospital • Northumbria Healthcare NHS Foundation Trust • Northwell Health • Northwestern Medicine, Feinberg School of Medicine • Northwestern University • Norwegian Center For E-health Research • Novartis • Novartis India • Novo Nordisk Inc. • NSI • nttdata • Nuance Communications • Nuffield Health (UK) • NYU Langone Health • OAKS Consulting s.r.o. • Odysseus Data Services • OHSU • Okayama University • Oklahoma U • OMNY Health • Oncoclinicas • Open Evidence • OPEN Health • Oppo Guangdong Mobile Communication Co., Ltd. • Optima • Optimum Patient Care Limited • Optum • Oracle Corp • Oregon Health & Science University • Oregon State University • Oslo University Hospital • OSU Medical Center • Ottawa Hospital Research Institute • Outcomes Insights • P E P I Consultancy Limited • P.G.M.D. Consulting Srl • p95 • Palo Alto VA medical center • Parc de Salut Mar Barcelona • Pareto Intelligence • Parexel International • Paris Saclay Cancer Cluster (PSCC) • Paxata • PCCI • Pedianet • PEDSnet • Peking Union Medical College Hospital • Peking University • Penn Medicine • Penn State College of Medicine • Penn State University • Peter MacCallum Cancer Foundation • Pfizer • Pharmacovigilance Program of India • PHC-Medicom • PHI Digital Healthcare • Philips Research • PhysioNet • PicnicHealth • Pirkanmaa Hospital District • Plateforme De Données De Santé • Plinth Analytics • Policlinico di Milano • Policlinico San Donato S.P.A. • Pontificia Universidad Católica de Chile • Pontificia Universidad Javeriana - Bogota, Colombia • PortoPiccolo Group • Portuguese Institute of Oncology of Porto • Precision Data • Premier Healthcare • Principia Health Sciences, Inc • Prisma Health • Promptly Health Analytics • Providence Global Center • PSMAR (Barcelona) • PSSJD • PUCPR • Purdue University • Pusan National University Hospital • Qassim University • Quang Ninh Department of Health • Queen Mary University Of London • Queensland Health • Quinten • RAACAI • Rambah Health Care • Rambah Medical Center • RCGP (UK) • Reading University • REDCap Cloud • Regeneron • Regenstrief Institute • Reliant Medical Group • Rice University • Rigshospitalet • RIVM • Robot Bacon • Roche • Roivant • Rotterdam School of Management, Erasmus University • Royal Children's Hospital • Royal Surrey Hospital • RTI Health Solutions • RTI International • Ruijin Hospital, Shanghai Jiao Tong University School of Medicine • rumor.ml • Roush UMC • Rutgers University • RWJ Barnabas • SA Health • Saarland University Hospital • Sage Bionetworks • SAIL Databank • Saint Louis University School of Medicine • Samsung Seoul Hospital • Samvit Solutions • San Diego State University • Sanata Dharma University • Sanford Health • Sanofi • University of Rome • SAS • Saudi Food and Drug Authority • Save the Children International • SBSHSL • Scibite • SciForce Solutions • SEA Healthcare • Secretaria Municipal da Saúde da Cidade de São Paulo • sema4 • SemanticClarity • Semantix • Semmelweis Egyetem • Sensyne Health • Sentara Healthcare • Seoul National University Boramae Hospital • Seoul National University Bundang Hospital • SERMAS & FIIBAP • Servicio de Salud Araucanía Sur • Servicio Navarro de Salud Osasunbidea • Seven Bridges • Severance Hospital • Shanghai Chest Hospital • Shenyang Pharmaceutical University • Shri Jagannath Medical College and Hospital • Shuanghe Hospital • SICS - A*STAR • SiData+ • Siemens Health Services • Sigma Ingeniería • Sigmadata Consulting Services • SIMG (Italy) • Singapore Health Services Pte Ltd • Siriraj Hospital • Six Aims LLC • SKM • SLUHN • Smartanalyst India Pvt Ltd • SMS-SP • SNOMED CT • Snowflake • SoftServe Inc • soft-tech • Soonchunhyang University Medical Center • Sorbonne University • South Western Sydney Local Health District • Spectrum Health • Spence • SpinSys • Spok • St Jude Children's Research Hospital • St. Luke's (Idaho) • Stanford Healthcare • Stanford School of Medicine • Stanford University • STATINMED • Stephens Family Clinical Research Institute • Stichting Integraal Kankercentrum Nederland • STIZON • Stony Brook Medicine • Stony Brook University • Sun Yat-sen University • Sunnybrook Research Institute • Swansea University • Swiss Re • Syapse • Sydney LHD • Sydney Local Health District • Symmetric Health Solutions • Sysmap • Taibah University • Taipei Medical University • Taipei Municipal Wanfang Hospital • Takeda • Talosix • Tampere University • Tan Tock Seng Hospital • Tarbiat Modares University • Tata Consultancy Services • Technical University Sofia • Technological University Dublin • Tehran University of Medical Sciences • Temote Systems • Tempus • Texas Childrens Hospital • Texas State University • Texas Zephyr Research • TFS HealthScience • The Christie NHS Foundation Trust • The Fifth Affiliated Hospital of Sun Yat-sen University • The Hospital District of Southwest Finland • The Hospital for Sick Children • The Hyve • The Royal Children's Hospital • Thomas Jefferson University • Tianjin Anding Hospital • Tianjin Medical University • TietoEVRY • Timformatix • Tokyo University • Touro College of Pharmacy • TrakPop Inc. • transSMART • TrialSpark • Trio Health • Triomics • TU Dresden • Tufts Medical Center • Tulane • Tuva Health • TVHS VA/ VUMC • U Aberdeen • U Alabama at Birmingham • U Alcalá • U Arizona • U Arizona, College of Medicine-Phoenix • U Arkansas • U Basel • U British Columbia • U Calgary • U California Los Angeles • U California San Diego • U California San Francisco • U Cambridge • U Canterbury • U Cape Town • U Chicago • U chinese academy of social society • U Cincinnati • U Colorado Anschutz Medical Campus • U Colorado School of Medicine • U Copenhagen • U Debrecen • U Deusto • U Dundee • U Edinburgh • U Florida • U Florida College of Medicine • U Florida School of Dentistry • U Galway • U Georgia • U Gothenburg • U Hong Kong • U IL Chicago • U Ilorin • U Iowa • U Iowa College of Pharmacy • U Kansas • U Kansas Medical Center • U Kent • U Kentucky • U Limerick • U Liverpool • U Louisville • U Lübeck, Germany • U Macau • U Maine • U Manchester • U Maryland • U Maryland Baltimore • U Mass Memorial MC • U Melbourne • U Miami • U Michigan School of Dentistry • U Michigan, Ann Arbor • U Minho • U Minnesota • U Mississippi MC • U Missouri-Columbia • U Missouri-Kansas City • U Nebraska Medical Center • U New England • U New Hampshire • U New Mexico • U New South Wales • U North Carolina at Chapel Hill • U Nottingham • U Oslo • U Oxford • U Pavia • U Pécs • U Pennsylvania • U Pittsburgh • U Porto • U Rochester • U Rochester Medical Center • U Rwanda • U San Francisco • U São Paulo Medical School • U South Australia • U South Carolina • U South Carolina College of Pharmacy • U Southern California • U Southern California Keck School of Medicine • U Sydney • U Tartu • U Tennessee Health Science Center • U Texas at Austin • U Texas Health Science Center at Houston • U Texas Southwestern Medical Center • U the Philippines Mania • U Toronto • U Tsukuba • U Twente • U Utah • U Utah College of Nursing • U Vermont • U Victoria • U Virginia • U Washington • U Wisconsin-Madison • U Witwatersrand • U.S. Navy • UBS Vila Dalva • UBuffalo • UCB • UCI • UCL • UFRN • Uganda Cancer Institute • UH Geneva • UHasselt • UHG (USA) • UIO • UiT - The Arctic University • UK Biobank • UK-CRIS • UKER • Ulsan University Hospital • Ultragenic Research and Technologies • UMass Chan Medical School • UMC New Orleans • UMC Utrecht • UMessina • UMMC • Umicap • Unidade Local De Saúde De Matosinhos Epe • Unified Patient Network • UNIMED DO BRASIL • UNITED HEALTH GROUP - BRAZIL • United Health Group Brasil • United States Air Force • Universidad Autonoma del Caribe • Universidad del Desarrollo • universidad politécnica de madrid • Università degli studi di Brescia • Universitaria Integrata Verona • Universität Leipzig • Universitätsmedizin Greifswald • Université De Bordeaux • Université De Genève • University Blanquerna • University College London • University Health Network • University Hospital of Parma • University hospital Basel • University Hospital for Tumors, Sestre milosrdnice University Hospital Center • University hospital of Parma • University hospital of Rennes • University Hospital of the Saarland • University Hospital Southampton • University Hospitals Bristol and Weston NHS Trust • Universitätsmedizin Greifswald • UNM Comprehensive Cancer Center • UNSW Sydney • US Department of Defense • US Department of Veterans Affairs • US Food & Drug Administration • US National Cancer Institute • US National Institutes of Health • US National Library of Medicine • USAID • USC • UT Southwestern Medical Center • Utah Health Workforce Information Center • Utrecht University • UWC • UZ Brussel • Vall D'Hebrón Hospital Campus • Vanderbilt University • Vanderbilt University Medical Center • VCU • VDH • Vector Institute • Ventech Solutions, Inc • Veradigm • VeraTech for Health • Verily Life Sciences • Vertex Pharmaceuticals • Veterinary Terminology Services Lab at Va Md College of Veterinary Medicine • Virginia Tech • VHA • VHBHC Institute • Virginia Commonwealth University • Virginia Tech University • VIRTUSA • Vivante Health Software • Vivent Health • Vrije Universiteit Amsterdam • VUMC • Wake Forest • Wanfang Hospital • Washington University • Weill Cornell Medical Center • Wellstack • Wemedo AG • WHO Uppsala Monitoring Centre • William Beaumont University Hospitals • Winship Cancer Institute of Emory University • WMichigan USOM • Wondersgroup • Wonju Severance Hospital • Wonkwang University Hospital • WVU • XuanWu Hospital • Yale School of Medicine • Yale University • Yongjin Severance Hospital • Yonsei University • Yuimedi, Inc. • Zebra Health Net • ZEG Berlin GmbH • zhejianglab • Ziekenhuis Oost-Limburg • ZNA • Zoaidigm • ZOL (Belgium) • ZS Associates

Testimonials From The

There is something unique about the OHDSI organization and how they support the community, which motivates the community to work as a whole. We know that with greater diversity and inclusiveness, there is greater creativity and innovation. The whole is always greater and bigger than the total sum of individuals.



Asiyah Lin

Senior Data Scientist Consultant, Axle Informatics

While my time in the OHDSI community is relatively brief, the environment struck a chord with me immediately. What stands out is how the community welcomes expertise from myriad backgrounds. Whether you're a seasoned researcher, a data scientist, a clinician, or even someone just starting in healthcare analytics, OHDSI is a platform



where different levels of familiarity converge to nurture actionable knowledge. Engaging with the various workgroups, events, and projects provides an avenue for personal and professional growth.

Atif Adam

Associate Director of Epidemiology, IQVIA

The fact that the community is open to everyone and anyone means that the opportunities to lead, step forward or even just listen from afar is all possible and so for me to be part of this ever-evolving community means I can bring my ideas and thought leadership with me.



Sarah Seager

Associate Partner, Infosys Consulting

A nice thing about OHDSI is the speed you can move from novice to intermediate and how people provide you with trust to perform analysis but also support you in doing so.



You're never left on an island, there is always a boat and someone willing to sail with you.

Simply put, my PhD would have been impossible without the OHDSI tool-stack and the community.

Ross Williams

Assistant Professor, Erasmus MC

OHDSI Community

OHDSI's mission, vision and values align with my views and desires to produce reliable, real-world evidence to inform decisions on their healthcare. I didn't set out to become a leader in the OHDSI community. "Pay it forward" is one of my favorite mottos and I enjoy sharing knowledge, mentoring, and teaching. OHDSI is such an open and welcoming community, it just came naturally to share what I have learned with others.



Melanie Philofsky

Senior Business & Data Analyst with Odysseus Data Services, Inc.



Connecting with the international OHDSI community has enabled us to use standardized data formats that are synchronized globally, which is fundamental for international collaboration. Additionally, we can utilize the high-quality and efficient data analysis tools developed by OHDSI, significantly enhancing our research efficiency and quality.

Jason Hsu

Assistant Professor, Taipei Medical University

**Collaborator
Spotlight
Homepage**



OHDSI has been amazing for giving me ideas on what to work on throughout my PhD journey, including class projects and my thesis. I have floated in and out of several working groups to see where there might be potential project ideas or mentors for my research.



As an informatics student, one of the huge barriers is access to a source of significant data that is fit for purpose. The OHDSI community is a great resource and is very collaborative.

Kerry Goetz

Associate Director, National Eye Institute's Office of Data Science and Health Informatics

The Titan Awards

The Titan Awards, first introduced in 2018, recognize OHDSI collaborators (or collaborating institutions) for their contributions towards OHDSI's mission.

Each year, community members nominate individuals or institutions they feel have made significant contributions towards advancing OHDSI's mission, vision and values. Once nominations are submitted, the OHDSI Titan Award Committee selects the recipients, and the honorees are announced at the annual Global Symposium.

The award categories, past recipients and 2024 Titan nominees can be found in this section.

Data Standards

This Titan Award recognizes extraordinary contributions by an individual, organization, or team in development or evaluation in community data standards, including OMOP common data model and standardized vocabularies

2023 – Gowtham Rao and Azza Shoaibi, Janssen Research and Development

2022 – Melanie Philofsky, Odysseus Data Services

2021 – Maxim Moinat, The Hyve/Erasmus University Medical Center

2020 – Clair Blacketer, Janssen Research and Development

2019 – Oncology Workgroup (Michael Gurley, Northwestern University; Rimma Belenkaya, Memorial Sloan Kettering Cancer Center; Robert Miller, Tufts CTSI)

2018 – Vocabulary team (Christian Reich, IQVIA; Anna Ostropelets, Columbia University; Dmitry Dymshyts, Odysseus Data Services)



**Gowtham Rao
2023 honoree**



**Azza Shoaibi
2023 honoree**

Methods Research

This Titan Award recognizes extraordinary contributions by an individual, organization, or team in development or evaluation in analytical methods for clinical characterization, population-level effect estimation, or patient-level prediction

2023 – Jiayi (Jessie) Tong, University of Pennsylvania

2022 – Fan Bu, University of California, Los Angeles

2021 – Yong Chen, University of Pennsylvania

2020 – Nicolas Thurin, Université de Bordeaux

2019 – Jenna Reps, Janssen Research and Development

2018 – Martijn Schuemie, Janssen Research and Development; Marc Suchard, University of California, Los Angeles



**Jiayi (Jessie) Tong
2023 honoree**



Open-Source Development

This Titan Award recognizes extraordinary contributions by an individual in design, development, testing, and deployment of open-source software to enable observational analyses

2023 – Katy Sadowski, Boehringer Ingelheim

2022 – Egill Fridgeirsson, Erasmus MC; James Gilbert, Janssen Research and Development

2021 – Adam Black, Odysseus Data Services

2020 – Anthony Sena, Janssen Research and Development

2019 – Pavel Grafkin, Odysseus Data Services

2018 – Christopher Knoll, Janssen Research and Development



Katy Sadowski
2023 honoree

Clinical Applications

This Titan Award recognizes extraordinary contributions by an individual, organization, or team in generating clinical evidence that improves health by informing better health decisions and better care

2023 – Center for Surgical Science (led by Ismail Gögenur)

2022 – Xintong Li, University of Oxford

2021 – Asieh Golozar, Odysseus Data Services

2020 – Jenny Lane, University of Oxford

2019 – Oxford Study-A-Thon (Dani Prieto-Alhambra, University of Oxford; Edward Burn, University of Oxford; Jamie Weaver, Janssen Research and Development; Ross Williams, Erasmus University Medical Center)

2018 – Seng Chan You, Ajou University



Center for Surgical Science • 2023 honoree



2023 Titan Award honorees (not pictured: Nicole Pratt)

OHDSI COLLABORATORS

Community Collaboration

This Titan Award recognizes an individual for their collaborative spirit in helping their fellow community members reach their goals.

2023 – Cynthia Sung, Bill & Melinda Gates Medical Research Institute

2022 – Ajit Londhe, Boehringer Ingelheim

2021 – Erica Voss, Janssen Research and Development

2020 – Talita Duarte-Salles, IDIAPJGol

2019 – Andrew Williams, Tufts Medical Center

2018 – Kristin Kostka, Deloitte; Mui Van Zandt, IQVIA



Cynthia Sung
2023 honoree

Community Support

This Titan Award recognizes an individual, team, or organization for their contributions to ensuring the sustainability of the OHDSI community.

2023 – Gyeol Song, IQVIA

2022 – Craig Sachson, Columbia University

2021 – Faaizah Arshad, UCLA; Ross Williams, Erasmus University Medical Center

2020 – COVID-19 Support Team, Erasmus University Medical Center

2019 – James Wiggins, Amazon Web Services

2018 – Lee Evans, LTS Computing LLC



Gyeol Song
2023 honoree

Community Leadership

This Titan Award recognizes an individual for their leadership in advancing the OHDSI mission.

2023 – Nicole Pratt, University of South Australia

2022 – Paul Nagy, Johns Hopkins University

2021 – Mui Van Zandt, IQVIA

2020 – Dani Prieto-Alhambra, University of Oxford

2019 – Peter Rijnbeek, Erasmus University Medical Center

2018 – Rae Woong Park, Ajou University School of Medicine



Nicole Pratt
2023 honoree

Congratulations to our 2024 nominees!

Alexander Davydov • **Andrew Kanter** • Anna Ostropolets • **Anthony Sena** • April Olympians Team • **Asieh Golozar** • Ben Martin • **Benjamin Viernes** • Christopher Mecoli • **Cindy Cai** • Clair Blacketer • **Cynthia Sung** • Daniel Morales • **Danielle Boyce** • DARWIN EU Development Team • **Elisse Katzman** • Evanette Burrows • **Eye Care and Vision Research Workgroup** • Frank DeFalco • **George Hripcsak** • Greg Klebanov • **Henrik John** • Hsin Yi Chen • **J Swetha Kiranmayi** • Jack Janetzki • **James Weaver** • Jared Houghtaling • **Jen Park** • Joel Swerdel • **John Gresh** • Jung Ho Kim • **Justin Manjourides** • Kyle Zollo-Venecek • **Liesbet Peeters** • Linying Zhang • **Louis Hendricks** • Maarten van Kessel • **Manlik Kwong** • Marc Suchard • **Marta Pineda-Moncusi** • Marti Catala Sabate • **Martijn Schuemie** • Martin Lavalley • **Maxim Moinat** • Michael Gurley • **Michael Matheny** • Michel Walravens • **Michelle Hribar** • Minnesota EHR Consortium Health Trends Across Communities Project Team • **Montse Camprubi** • Mengling 'Mornin' Feng • **Natthawut 'Max' Adulyanukosol** • OHDSI APAC ETL Team • **O-HDSI Standardized Vocabularies Team** • Oleg Zhuk • **Parthiban Sulur** • Polina Talapova • **Qi Yang** • Renske Los • **Rich Boyce** • Robert Koski • **Robert Miller** • Roger Carlson • **Scott DuVall** • Thamir Alshammary • **Theresa Burkard** • Thomas Falconer • **Tom Seinen** • Vishnu Chandrabalan • **Vlad Korsik** • Will Kelly • **Zhen Lin**



OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

IV.

Collaborative Events & Activities



The OHDSI Symposium

There is nothing quite like an OHDSI symposium.

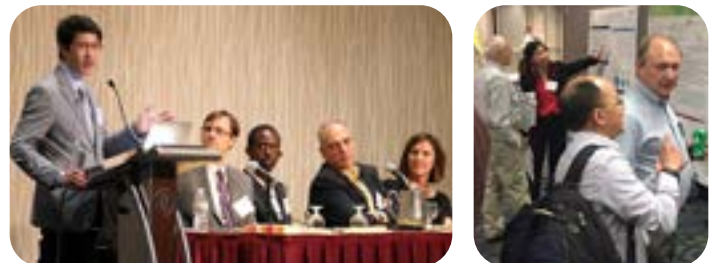
From events held in the U.S., Europe or Asia, our annual symposia are among the most anticipated events of the year. Plenary talks, tutorials, workshops and the collaborator showcase create opportunities to share research, learn from each other, and collaborate on future opportunities.

These events also allow our global community an opportunity to connect face-to-face. Whether it is to share scientific breakthroughs, build massive Lego sets or dance on stage together, each symposium brings our community together and sets new paths for collaboration.

Oct. 20, 2015 • Washington, D.C.



Sept. 23-24, 2016 • Washington, D.C.



Oct. 18-20, 2017 • Bethesda, Md.



Mar. 23-24, 2018 • Rotterdam, Neth.



COLLABORATIVE EVENTS & ACTIVITIES

Oct. 11-13, 2018 • Bethesda, Md.

Mar. 29-30, 2019 • Rotterdam, Neth.



June 27-29, 2019 • Guangzhou, China

Sept. 15-17, 2019 • Bethesda, Md.



Dec. 12-14, 2019 • Gwangju, Korea

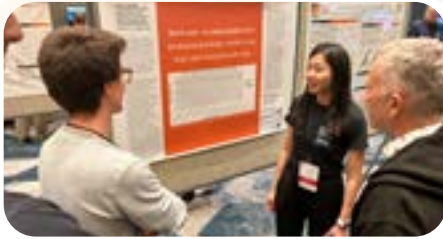
June 24-26, 2022 • Rotterdam, Neth.



COLLABORATIVE EVENTS & ACTIVITIES

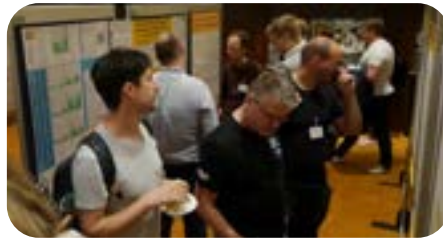
Oct. 14-16, 2022 • Bethesda, Md.

July 13-14, 2023 • Sydney, Australia



July 1-3, 2023 • Rotterdam, Neth.

Oct. 20-22, 2023 • East Brunswick, N.J.



Nov. 12-13, 2023 • Taipei, Taiwan

June 1-3, 2024 • Rotterdam, Neth.



Relive #OHDSI2024



This annual publication is produced prior to each year's global symposium, so we can't share images or outcomes from the 2024 event yet. However, OHDSI2024 promises to be a memorable one, including talks around 'Clinical Insights from LEGEND-T2DM' and the 'Value Proposition for Participating in OHDSI Network Studies like LEGEND-T2DM', five tutorials, more than 130 posters/software demos and more.

Check out the agenda below, and use the QR code after the event to find recordings of the talks and tutorials, posters and all other materials!

Tutorials

An Introduction to the Journey from Data to Evidence Using OHDSI

Faculty: Daniel Prieto-Alhambra, Jenna Reps, Mui Van Zandt, Erica Voss, Linyiing Zhang

Conducting 'Off-The-Shelf' Characterization Studies Using DARWIN EU® Tools and the OMOP CDM

Faculty: Edward Burn, Dani Prieto-Alhambra, Martí Català Sabaté, Maarten van Kessel

Developing and Evaluating Your Extract, Transform, Load (ETL) Process to the OMOP Common Data Model

Faculty: Clair Blacketer, Melanie Philofsky, Katy Sadowski

So, You Think You Want To Run an OHDSI Network Study?

Faculty: Yong Chen, Nicole Pratt, Anthony Sena, Andrew Williams, Seng Chan You

Using the OHDSI Standardized Vocabularies for Research

Faculty: Anna Ostropelets, Vlad Korsik, Azza Shoaibi, Polina Talapova, Oleg Zhuk

#JoinTheJourney

Presentations

State of the OHDSI Community

Presenters: George Hripcsak, Amber Reed

Clinical Insights from LEGEND-T2DM

Presenters: Arya Aminorroaya, Phyllis Thangaraj, Hannah Yang, Daniel Morales, Aline Pedroso

Value Proposition for Participating in OHDSI Network Studies

Presenters: Clair Blacketer, Scott Duvall, Talita Duarte-Salles, Thanh-Phuc Phan, Atif Adam

Panel: JACC-OHDSI Partnership

Presenters: Harlan Krumholz, Seng Chan You, Yuan Lu, Nicole Pratt, Marc Suchard

Showcase Lightning Talks

Presenters: Kathleen Mullen, Joel Swerdel, Sujin Gan, Edward Burn, Jiayi Tong, Dazheng Zhang, Samuel Patnoe, Hsin Yi Chen

Collaborator Showcase

120 posters
16 software demos

Closing Talk

Presenter: Patrick Ryan

OHDSI Community Calls

The weekly OHDSI community call brings our global network together to share research, discuss various topics around observational health, keep apprised on community updates, learn about recent OHDSI research, open-source tools or best practices within the community, meet potential collaborators, and plenty more. Our weekly calls, led by Craig Sachson, take place on Tuesdays at 11 am ET. They are recorded and posted to both OHDSI.org and our YouTube channel.

This section highlights many of the meeting topics over the last year; please check out ohdsi.org/community-calls to learn more about these interactive community gatherings.

Sept. 5: DARWIN EU® Progress and Roadmap

 **Peter Rijnbeek**
Professor of Medical Informatics and Chair, Department of Medical Informatics, Erasmus MC

 **Katia Verhamme**
Associate Professor of Use and Analysis of Observational Data, Department of Medical Informatics, Erasmus MC

 **Ed Burn**
Senior Researcher in Epidemiology and Health Economics, University of Oxford

Sept. 19 • OHDSI Journal Club: 11th Revision of the ENCePP Guide on Methodological Standards in Pharmacoepidemiology

 **Catherine Cohet**
Pharmacoepidemiology Senior Specialist, HSE, HSE/Healthcare, Data Analytics & Research Task Force, European Medicines Agency

 **Xintong Li**
PhD Student in Medical Statistics and Clinical Epidemiology, University of Oxford

 **Kim López Güell**
PhD Student in Medical Statistics and Clinical Epidemiology, University of Oxford

 **Daniel Morales**
Senior Pharmacovigilance, European Medicines Agency

 **Niklas Norén**
Chief Science Officer, Swedish Centre

 **Luis Pinheiro**
Senior Epidemiology Expert, European Medicines Agency

 **Albert Prats-Uribé**
Senior Clinical Researcher and Public Health Specialist, University of Oxford

 **Dani Prieto-Alhambra**
Section Head - Health Data Science, Senior Research Fellow and Professor, University of Oxford and Erasmus MC

Jan 23: 2023 UK Study-a-Thon Lessons Learned

 **Dani Prieto-Alhambra**
Professor of Pharmaco- and Device Epidemiology, Oxford University

 **Jennifer Lane**
NHR Clinical Lecturer in Trauma and Orthopaedic Surgery, Barts Bone and Joint Health, Queen Mary Univ. of London

 **Katherine Donegan**
Head of Epidemiology, MHRA

 **Annika Jodicke**
Senior Researcher in Pharmacoepidemiology, University of Oxford


Jan 30: Introduction to Phenotype Phebruary


 **Azza Shoabi**
Director, Observational Health Data Analytics, Janssen Research and Development


 **Anna Ostroplets**
Associate Director, Observational Health Data Analytics, Janssen Research and Development


 **Jamie Weaver**
Associate Director, Observational Health Data Analytics, Janssen Research and Development

March 5: Vocabulary Release Update

 **Alexander Davydov**
Director, Lead of Medical Ontologies, Odysseus Data Services

 **Oleg Zhuk**
Vocabulary Technical Lead, Odysseus Data Services

 **Anna Ostroplets**
Associate Director, Observational Health Data Analytics, Janssen Research and Development

 **Christian Reich**
CEO, Odysseus Data Services

This call will also include a closing presentation on Phenotype Phebruary 2024.

Thank you to everybody who joined in this community activity!

March 26: Recent OHDSI Publications

 **Tathagata Bhattacharjee • University of London**
POPPS Analysis: a pan-African integrative suite of services for harmonising longitudinal population health data using OHDSI tools • *Problems in Digital Health*

 **Sulev Reisberg • University of Tartu**
Transforming Estonian health data to the Observational Medical Outcomes Partnership (OMOP) Common Data Model: lessons learned • *JAMIA Open*

 **Fan Bu • University of Michigan**
Respiratory safety surveillance with adaptive data correction • *Statistics in Medicine*

 **Jen Wooyeon Park • Johns Hopkins University**
Development of Medical Imaging Data Standardization for Imaging-Based Observational Research (IMOP) Common Data Model Extension • *Journal of Imaging Informatics in Medicine*

 **Christian Reich • Odysseus**
OHDSI Standardized Vocabulary—a large-scale controlled reference ontology for international data harmonization • *JAMIA*

COLLABORATIVE EVENTS & ACTIVITIES

April 16: Tools to Evaluate ETL



Frank DeFalco
Senior Director
Observational Health Data Analytics
Janssen Research & Development



Katy Sadowski
Senior Associate Director
Boehringer Ingelheim

April Olympians
Week 3 Update



Clair Blacketer
Director
Janssen Research & Development



Melanie Philofsky
Senior Business Analyst and Project
Manager, Genomics Data Services, Inc.

May 7: DevCon Review



Paul Nagy
Johns Hopkins University
Topic: Open Source ETL



Vishnu Chandrabalan
Lancaster University
Topic: Collaborative - The Next Step in the way we work



Roger Carlson
Sportsman Health
Topic: Working SMART to the Cloud w/ DDT & Snowflake



Adam Black
Erasmus MC
Topic: Building ICD-10 Diagnostic Systems



Lee Evans
UTi Computing LLC
Topic: ETL on the Cloud



Frank DeFalco
Janssen Research & Development
Topic: Technical Advances from OHDSI updates



Katy Sadowski
Boehringer Ingelheim
Topic: ETL on the Cloud

May 14: 10-Minute Tutorials



Martí Català Sabaté
Medical Statistician/Data Scientist
University of Oxford



Kim López Güell
Digital Student
University of Oxford



Maarten van Kessel
Software Developer
Erasmus MC



Louisa Smith
Assistant Professor
Northwestern University

Drug Utilization

Cohort Survival

Treatment Patterns

All of Us Research

May 21: Open Network Studies



Atif Adam
Associate Director of Epidemiology
ICVSA



Linying Zhang
Assistant Professor of Biostatistics
Washington University School of
Medicine in St. Louis



Chungsoo Kim
Postdoctoral Associate
Yale University



Daniel Morales
Wellcome Trust Clinical Research
Fellow
University of Dundee

June 11: European Symposium Review



Peter Rijnbeek
Professor of Medical Informatics and Chair of the Department
of Medical Informatics, Erasmus MC



Maxim Moinat
Scientific Researcher, Erasmus MC



Cesar Barboza Gutierrez
Software Developer, Erasmus MC



Liesbet Peeters
Assistant Professor of Biomedical Data Sciences, UHasselt



June 18: Application of LLMs in RWE Generation



Yilu Fang
PhD Student, Columbia University



João Almeida
Assistant Professor, Chief Information Security Officer,
University of Aveiro



Martijn Schuemie
Research Fellow, Epidemiology Analytics, Janssen Research and
Development

July 16: HowOften Initiative & Early Results



Hsin Yi "Cindy" Chen
MD-PhD Student
Columbia University Department of Biomedical Informatics



Azza Shoaibi
Director, Observational Health Data Analytics
Janssen Research and Development



Elise Ruan
Clinical Informatics Fellow
NewYork-Presbyterian Hospital/Columbia University



George Hripcsak
Professor of Biomedical Informatics
Columbia University

July 30: Patient-Level Prediction



Jenna Reys
Johnson & Johnson



Chen Yanover
KI Research Institute



Henrik John
Erasmus MC



Alexander Saelmans
Erasmus MC



Egill Friðgeirsson
Erasmus MC

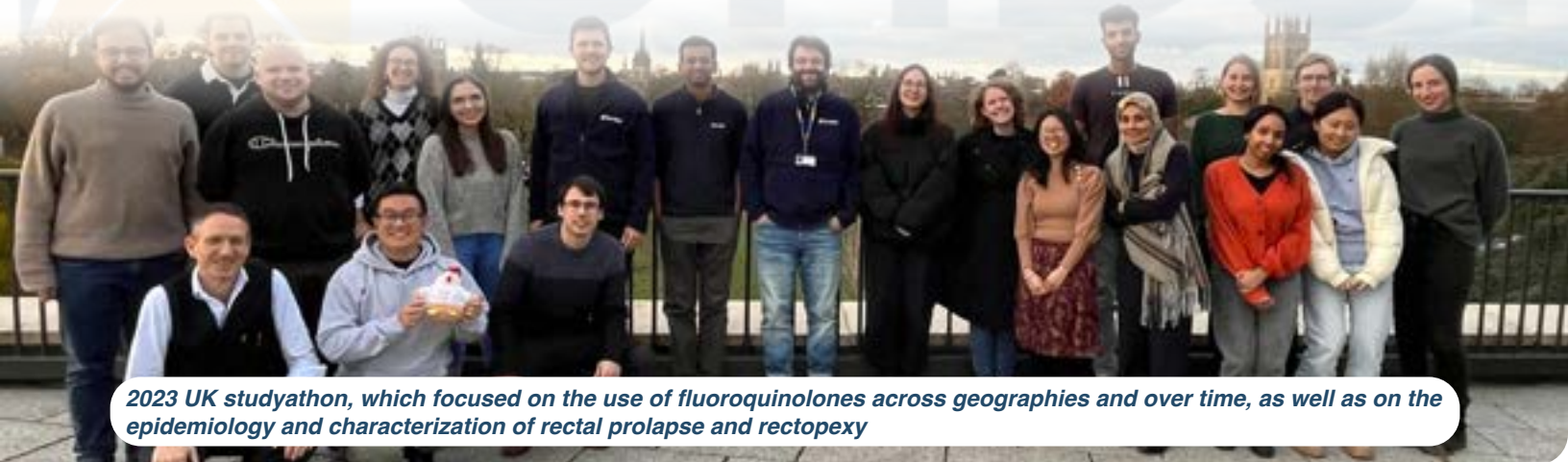


Ross Williams
Erasmus MC

How Can You Join Our Calls?

If you are a part of the OHDSI Teams environment, you will receive a weekly calendar invite that includes the upcoming agenda. If you don't have access, the link is on our Community Calls page, which features all recordings and updates from past calls. Weekly calls are currently held on Tuesdays at 11 am ET. Learn more at our website: www.ohdsi.org/community-calls

COLLABORATIVE EVENTS & ACTIVITIES



2023 UK studyathon, which focused on the use of fluoroquinolones across geographies and over time, as well as on the epidemiology and characterization of rectal prolapse and rectopexy

OHDSI Studyathons & Other Events

How does OHDSI go about *empowering a community to collaboratively generate the evidence that promotes better health decisions and better care?*

We do it by innovating on what it means to do collaborative research.

The premise of the studyathon is simple: bring together a diverse group of researchers aligned on a common question and focus together on collaboratively designing research protocols, executing analyses across databases, and interpreting results over an intense but fun-filled few days.

OHDSI collaborators have held multiple study-a-thons on a wide array of topics, including orthopedic surgery, rheumatoid arthritis, colorectal cancer, cardiovascular prediction, prostate cancer, and COVID-19. Each event has demonstrated our collective ability to accomplish in a short time what may be unimaginable alone, and it has provided further reinforcement of the power of community and the value of multi-disciplinary collaboration.



Outline flow of a study-a-thon. Graphic was shared in "Evaluating a novel approach to stimulate open science collaborations: a case series of "study-a-thon" events within the OHDSI and European IMI communities" • *Jamia Open*, Volume 5, Issue 4, December 2022, ooac100, <https://doi.org/10.1093/jamiaopen/ooac100>.

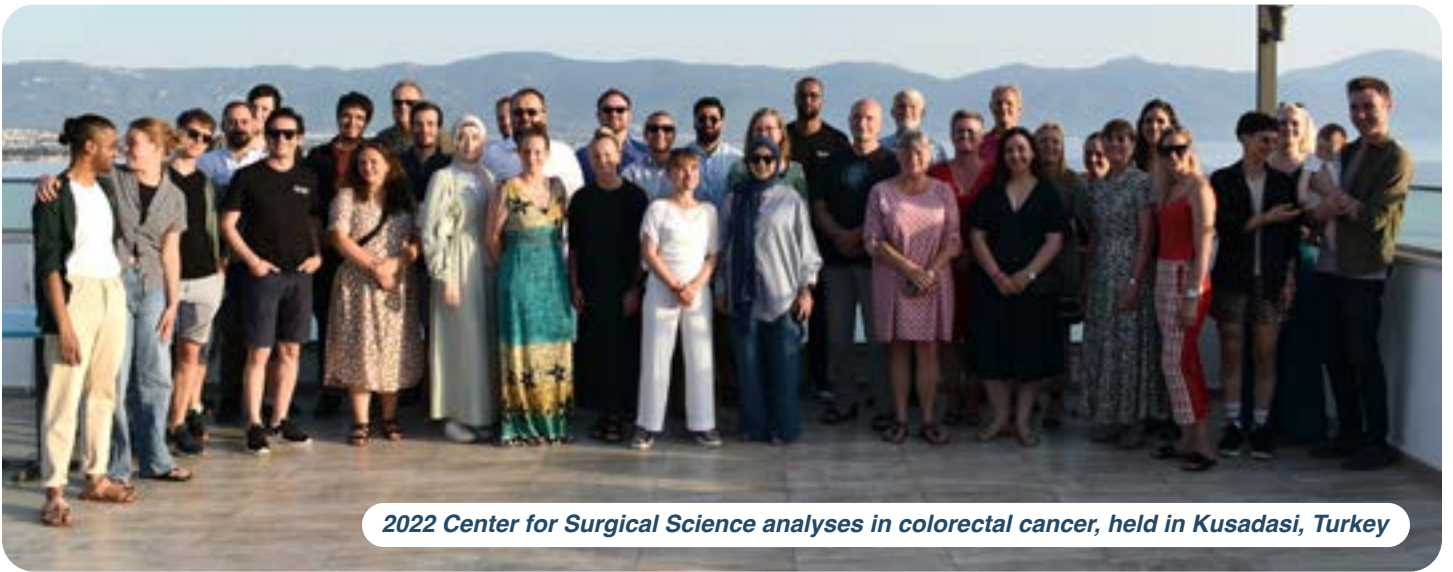


2022 Sweden EHDEN studyathon, which focused on pharmacovigilance

COLLABORATIVE EVENTS & ACTIVITIES



2022 Oxford/EHDEN studyathon, which focused on Long COVID/PASC



2022 Center for Surgical Science analyses in colorectal cancer, held in Kusadasi, Turkey



2022 Korea Datathon

Phenotype Phebruary

“Phenotype Phebruary” is a community-wide initiative to advance the field of phenotyping in observational studies. Now in its third year, the most recent Phenotype Phebruary focused on assessing consistency in phenotype definition components, phenotype representation structure, and phenotype validation methods.

By the end of this past Phebruary, collaborators identified and reviewed 93 clinical studies, developed an ATLAS and CohortDiagnostics demo, built and publicly shared 30 cohort definitions, and created three shiny apps with full cohort diagnostics on results.ohdsi.org. The team also put together over 8,000 incidence rates. Work continued afterwards within the OHDSI forums and during calls within the Phenotype Development & Evaluation workgroup.

Interested to learn more? Check out videos and updates from the event homepage:

ohdsi.org/phenotype-phebruary-2024

Community members voted to focus efforts on four specific phenotypes:

- Alzheimer’s Disease
- Lung Cancer
- Major Depression Disorder
- Pulmonary Hypertension

Under the leadership of Azza Shoaibi, Anna Ostropolets, Gowtham Rao and James Weaver, a team of 40+ collaborators worked on systematic literature searches and synthesis, replication using ATLAS and other OHDSI tools, and summarizations of variations in population characteristics like incidence rates.



Phenotype
Phebruary

- 4 condition phenotypes discussed
- 93 clinical studies identified and reviewed
- 1 Atlas and CohortDiagnostics demo
- 30 Cohort definitions built and publicly shared
- 3 shiny apps with full cohort diagnostics on results.ohdsi.org
- 8784 Incidence rate estimates
- 40 collaborators interacted in the posts, conducted literature review, built cohorts, or attended calls
- 1 AMIA submission accepted for oral presentation

By The Numbers

April Olympians

April Olympians was born out of the need to create a comprehensive community resource library that would serve as a central repository for conventions related to data transformation to the OMOP Common Data Model. Three key working groups—CDM, THEMIS, and Data Quality (DQ)—came together with a shared goal: to develop this resource in a way that maximizes productivity and engagement.

By the end of April, the collaborative effort had produced a robust knowledge base of CDM conventions. Over 80 GitHub issues were closed, thanks to the dedication of 20 consistent contributors from the OHDSI community. The resulting THEMIS convention library is now a valuable resource for the entire community.

April Olympians not only achieved its immediate goal of creating a THEMIS convention library but also strengthened our understanding of what makes collaborative science work.

Team Science Drove April Olympians Success

In order to achieve the goals set by the April Olympians organizers, community volunteers joined one of three specialized teams that were assigned key tasks.



Hunters

Focused on identifying and collecting ratified CDM conventions



Writers

Tasked with documenting these conventions for the resource library



Builders

Responsible for constructing the actual library

Lessons in Team Science

April Olympians provided valuable insights into effective team science. Some key takeaways include:

Do:

- Prepare comprehensive materials to engage participants.
- Be responsive to maintain momentum.
- Break tasks into small, manageable chunks.
- Test permissions and ensure everyone has the necessary access.
- Empower participants to foster a sense of ownership.
- Recognize contributions to encourage ongoing participation.

Don't:

- Use intimidating language that could deter participation.
- Overschedule meetings; allow time for more asynchronous work.
- Create overly complex task descriptions that could raise barriers to entry.

Thank You, Organizers, Leads & Contributors!



Clair Blacketer



Melanie Philofsky



Erica Voss



Evanette Burrows



Jiawei Qian



Katy Sadowski



Maxim Moinat

Meghan Pettine
Lloyd Shipman
Adam Bouras
Dave Jarvis

Solmaz Eradat
Brooke Lawler
Ben Martin
Andrew Kanter

Alvaro Alvarez
Agnes Wojciechowski
Masha Khitrin

DevCon

The third annual OHDSI DevCon was held in April, and it served as an opportunity to connect our global open-source community and discuss ways we can collaborate and continue enhancing the future of OHDSI open-source software. Virtual presentations, panel discussions and ecosystem updates provided leaders in our open-source community a forum to share some of the exciting recent developments within our community.

Videos from the DevCon presentation can be accessed via the QR code below. Presentations from both the 2022 and 2023 DevCon are also available on the website or our YouTube channel. We hope you can join us for our 2025 event!

DevCon 2024 Agenda

Introduction (Adam Black and Paul Nagy)

ETL Developers' Panel & Lightning Talks (Katy Sadowski)

OHDSI/OMOP — The hard way is the easy way! (Vishnu V Chandrabalan)

Moving OMOP to the Cloud With DBT and Snowflake (Roger Carlson)

Use cases for ORMs in OMOP (Georgina Kennedy)

Carrot: code-free OMOP ETL without full data access (Sam Cox)

Rabbit-in-a-blender – an ETL pipeline to transform your EMR data into OMOP (Pieter-jan Lammertyn)

DARWIN EU® Developers Update

CDMConnector (Adam Black)

PatientProfiles (Mike Du)

CohortCharacteristics (Martí Català Sabaté)

CohortSurvival (Kim López Güell)

OHDSI Ecosystem Updates

Techology Advisory Board (Frank DeFalco)

Strategus Update (Anthony Sena)

Broadsea Update (Lee Evans)

Kheiron Training Program Update (Paul Nagy)

Watch the DevCon
Presentations



JACKALOPE PLUS The Power of ML for Healthcare Data Mapping & Management (Denys Kaduk)

An Introduction to Knowledge Graphs using PheKnowLator and OMOP2OBO with Example Applications in Drug Surveillance and Computational Phenotyping (Tiffany Callahan)



OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

V.

Educational Resources



Educational Resources

How do I learn more about OMOP, OHDSI tools, methods or best practices?

That is a very common question for those both starting their journey and those who have been traveling with OHDSI for years. There is always something new to learn, and there are always plenty who are willing to teach. OHDSI has a plethora of community-developed learning resources that we will share in this section.

On these pages, we will highlight the many tutorial options that have taken place around the world, most of which remain available on the OHDSI YouTube channel (youtube.com/c/OHDSI) or on the OHDSI website (ohdsi.org).

Tutorials

The OHDSI YouTube Channel (see QR code below) has posted numerous tutorials over the last decade, several of which have received thousands of views. Tutorials are often held at our annual symposia in the United States, Europe and Asia, but they can also be held in national events, such as ones in both Japan and Thailand this past year.

Tutorials are also often held during our weekly community calls (see pages 32-33), including a network study series from last year that is highlighted below. Many of our open-source leads have provided popular “10-Minute Tutorials” to highlight new or improved open-source tools developed for community research.

The next page will showcase the tutorials taking place at the 2024 Global Symposium. These will be posted to our YouTube channel shortly after the event.



S.O.S. Network Study Tutorials

The OHDSI community has the researchers, data, methods and motivation to lead network studies that can inform critical healthcare questions. The simple understanding of how to put it all together, however, can be both challenging and intimidating.

Our community tackled that challenge in 2023 with a nine-part series (see right) on how to lead a network study, so you can see the process from initiation to dissemination. Check out the full series on OHDSI.org/sos-challenge or our YouTube channel.

Weekly Series

- Initiating a Network Study
- Data Diagnostics
- Phenotype Development
- Phenotype Evaluation
- Creating Analysis Specifications
- Network Execution
- Study Diagnostics
- Evidence Synthesis
- Interpreting the Results

OHDSI YouTube Channel



OHDSI2024 Tutorial Offerings

The 2024 OHDSI Global Symposium featured five tutorials that will remain part of our community's educational resources.

Those early in the journey will want to check out the introductory tutorial (right), a four-hour session that provides a high-level overview of our community research.

We also held four advanced tutorials (below) on different focuses, ranging from vocabularies to open-source tools and ETL. Thank you to all our volunteer faculty for leading these sessions!



An Introduction to the Journey from Data to Evidence Using OHDSI

The journey from data to evidence can be challenging alone but is greatly enabled through community collaboration. In this half-day tutorial, we will introduce newcomers to OHDSI. Specifically, about the tools, practices, and open-science approach to evidence generation that the OHDSI community has developed and evolved over the past decade.



Daniel Prieto-Alhambra
University of Oxford,
Lizardus AG



Jenna Pepp
Janssen Research &
Development



Mai Van Zandt
AZURA



Erica Voss
Janssen Research &
Development



Lingying Zhang
Immunogen Technology,
UK, LMS

Conducting 'Off-The-Shelf' Characterization Studies Using DARWIN EU® Tools and the OMOP CDM

In this tutorial, students will learn from leaders in the DARWIN EU team about how to execute characterization analyses against their OMOP CDM instance using DARWIN EU packages, including how to define inputs to the standardized analytics and how to interpret standardized results. Students will also learn how DARWIN EU tools relate to and connect with OHDSI's broader open-source analytics ecosystem.



Edward Burt
University of Liverpool



Daniel Prieto-Alhambra
University of Oxford,
Pharmasoft



Matti Oksa-Salonen
University of Leicester



Matthew van Rossum
Lizardus AG

Developing and Evaluating Your Extract, Transform, Load (ETL) Process to the OMOP Common Data Model

In this tutorial, students will learn about the tools and practices developed by the OHDSI community to support the journey to establish and maintain an ETL to standardize your data to OMOP CDM and enable standardized evidence generation across a data network.



Gian Baccetti
Janssen Research &
Development



Ekincotte Butts
Janssen Research &
Development



Miriam Finlayson
University of Glasgow,
UK



Rory Sedgewick
Pharmasoft

So, You Think You Want To Run an OHDSI Network Study?

In this tutorial, students will learn about the steps along the journey to turn your research question into reliable evidence and how to lead an OHDSI network study. The OHDSI community has developed open-source standardized analytics tools that can be executed across a network of OMOP CDM databases and processes to facilitate collaborations between researchers throughout the evidence generation process from design through implementation and dissemination.



Ning Chen
University of Pittsburgh



Nicole Pratt
University of Zurich,
Janssen



Anthony Sene
Janssen Research &
Development



Andrew Williams
TUM University



Bing Guan Hu
Janssen Research &
Development

Using the OHDSI Standardized Vocabularies for Research

In this tutorial, students will learn how to take advantage of the OHDSI standardized vocabularies as an analytic tool to support your research, including searching for relevant clinical concepts, navigating concept relationships, creating Conceptsets and understanding source codes that map within these expressions. Students will also learn where the OHDSI standardized vocabularies is used throughout OHDSI's standardized analytic tools.



Anna Ostropeva
Janssen Research &
Development



Vlad Korsh
Oxymor Data Services,
UK



Azah Shoshit
Janssen Research &
Development



Felicia Talavera
Janssen



Qing Ding
Immunogen Tech Services,
UK

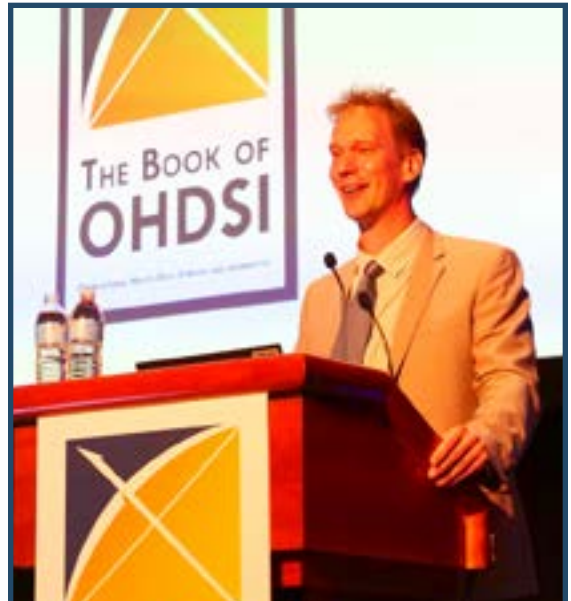
The Book of OHDSI

Published in 2019, the Book of OHDSI (book.ohdsi.org) aims to be a central knowledge repository for OHDSI, and it focuses on describing the OHDSI community, OHDSI data standards, and OHDSI tools.

It is intended for both OHDSI newcomers and veterans alike, and aims to be practical, providing the necessary theory and subsequent instructions on how to design and implement research yourself.

You will learn about the OMOP common data model and standard vocabularies, and how they can be used to standardize an observational healthcare database. You will learn about three analytic use cases for these data: characterization, population-level estimation, and patient-level prediction. You will read about OHDSI's open-source tools and how they can be applied to your data and how you can design and implement your own analyses following

OHDSI's best practices.



Martijn Schuemie, who co-led the Book of OHDSI development with David Madigan, introduced the book at the 2019 U.S. Symposium.



Members of the OHDSI community collaborated on documentation efforts for the Book of OHDSI at Case Western Reserve Univ. in Cleveland.

Chapters on data quality, clinical validity, software validity, and method validity will explain how to establish the quality of the generated evidence. Lastly, you will learn how to use the OHDSI tools to execute these studies in a distributed research network.

The Book of OHDSI is available for free online in English, Korean and Chinese, and can also be purchased through Amazon (all links on OHDSI.org).

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What Will You Find in The Book of OHDSI?

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The EHDEN Academy

The EHDEN Academy is a free, online educational resource for professionals in the domains of real-world data and real-world evidence. The Academy operates on a global scale and has engaged more than 5,200 active learners from more than 100 countries.

Its primary mission is to enhance the application and understanding of tools and methods that improve patient care globally through open science educational resources. Consequently, the Academy serves as a crucial training node for the wider OHDSI community, aligning with and directly contributing to its educational strategy.

Visit the
EHDEN
Academy



EHDEN Academy Student Map



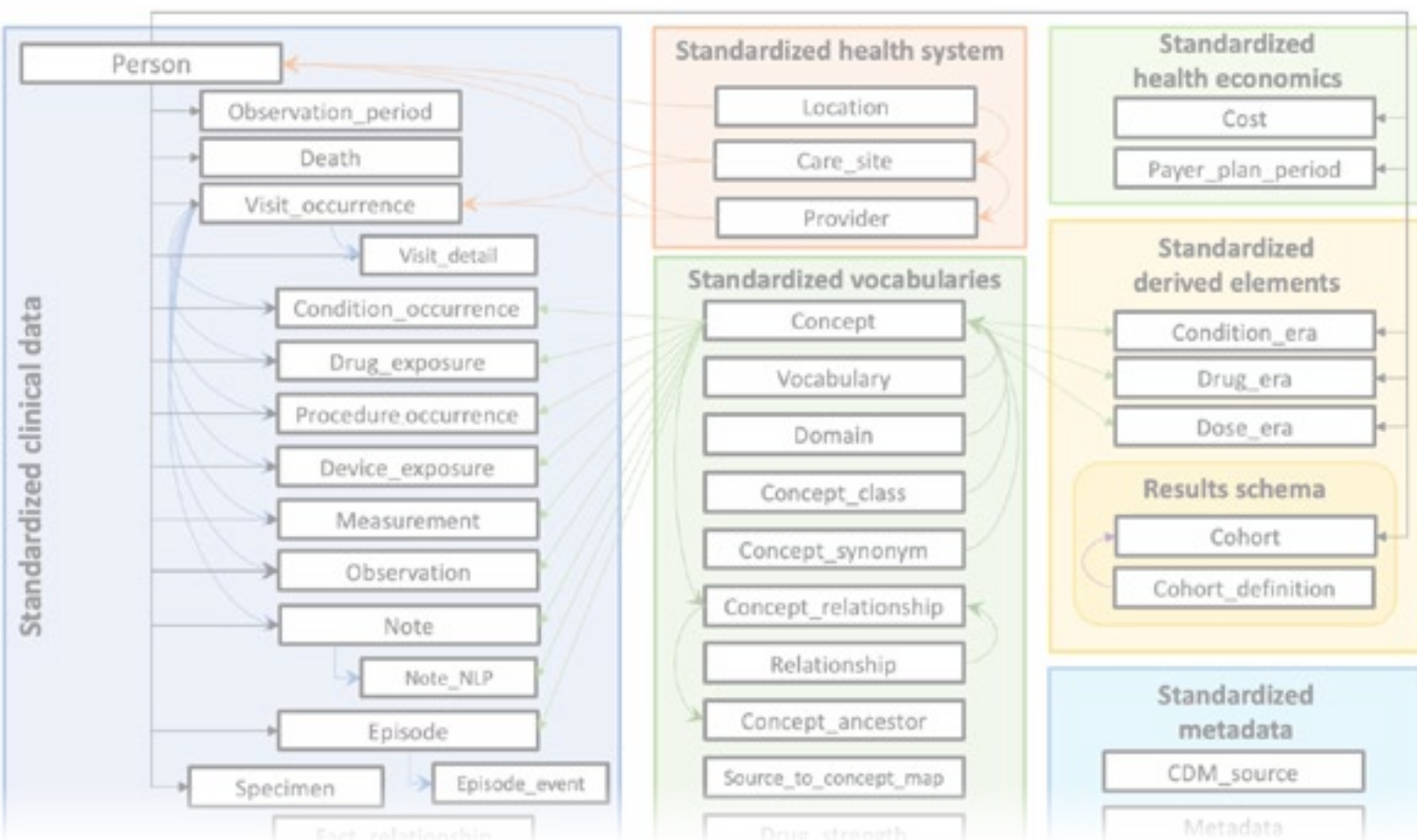
Current EHDEN Academy Courses

- Getting Started
- EHDEN Foundation
- Patient Organisations: Introduction to Real World Data & Real World Research
- OMOP CDM and Standardised Vocabularies
- ATLAS
- Infrastructure
- ETL Learning Pathway: Data Partner & SME Real World Use Cases
- 10-Minute Tutorial: PheValuator
- 10-Minute Tutorial: ATHENA
- Introduction to Usagi & Code Mappings for an ETL
- OHDSI-in-a-Box
- Open Science & FAIR Principles
- Introduction to Data Quality
- Phenotype Definition, Characterisation and Evaluation
- Population-level Effect Estimation
- Patient-level Prediction
- R for Patient-level Prediction
- Applied Cost-Effectiveness Modeling with R
- Assessing healthcare using outcomes that matter to patients
- Creating Cohort Definition (OHDSI 2022 Tutorial)
- OMOP Common Data Model/Vocabulary (OHDSI 2022 Tutorial)
- The Phenotyping Problem (1-hour session)
- Health Technology Assessment



VI.

Data Standards



OMOP Common Data Model

The Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) is an open community data standard, designed to standardize the structure and content of observational data and to enable efficient analyses that can produce reliable evidence.

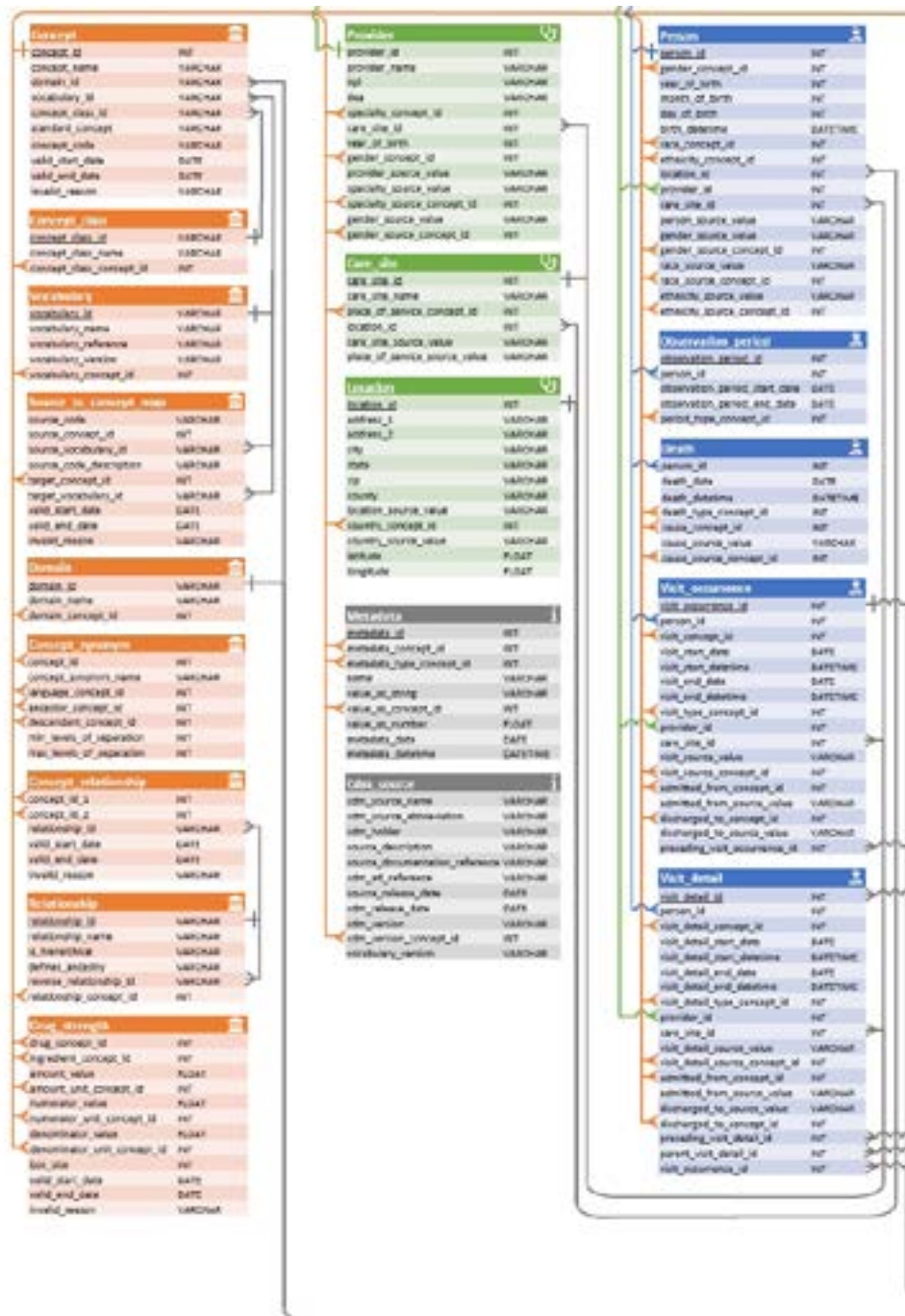


“The OMOP Common Data Model serves as the foundation of all our work in the OHDSI community, and I’m proud that our open community data standard has been so widely adopted and so extensively used to generate reliable evidence.”

- Clair Blacketer
2020 Titan Award for Data Standards recipient

OMOP Common Data Model 5.4

figure courtesy of Renske Los and Martijn Schuemie



OMOP CDM By The Numbers

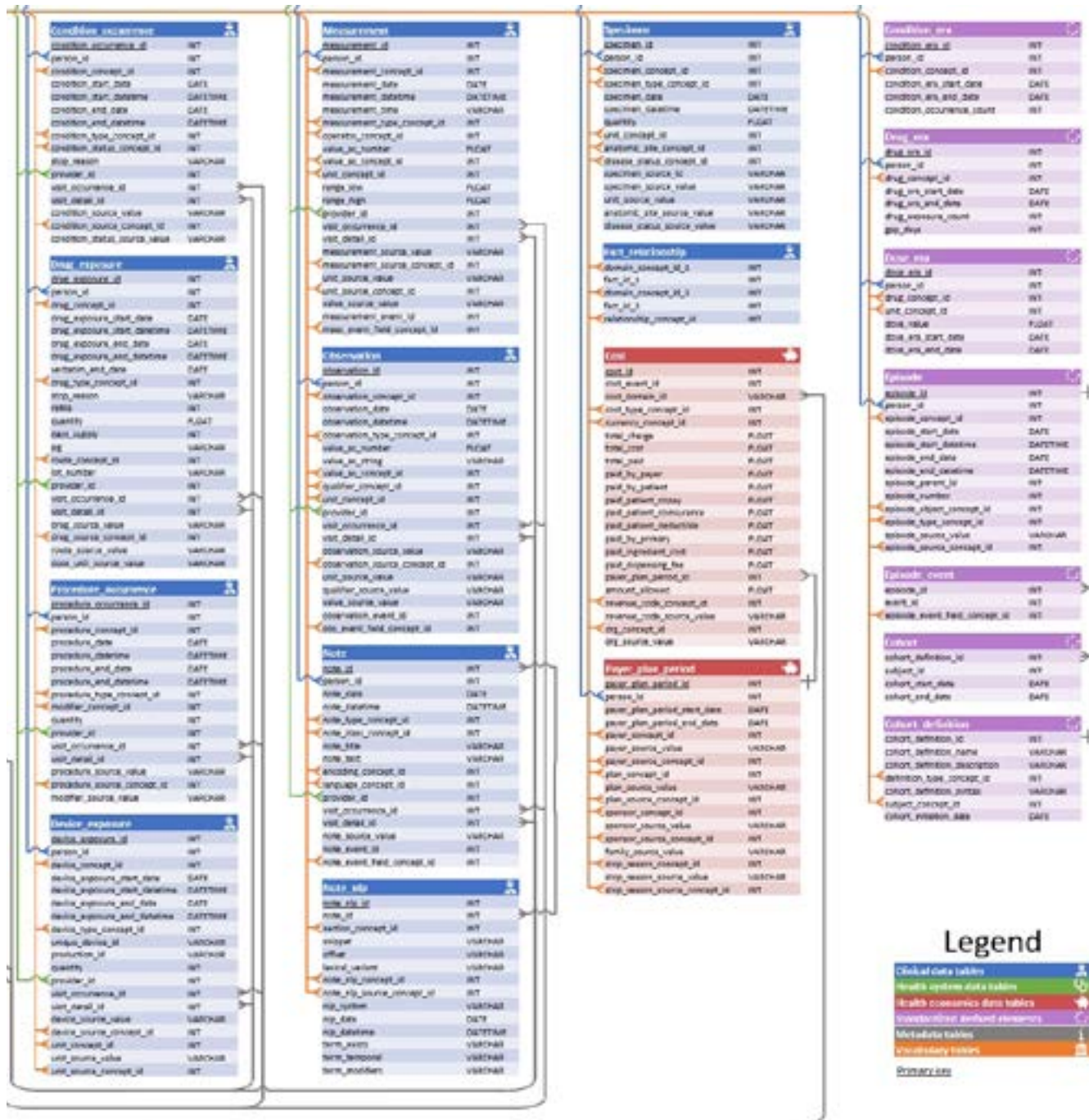
37 tables

- 17 to standardize clinical data
- 10 to standardize vocabularies

394 fields

- 193 with `_id` to standardize identification
- 101 with `_concept_id` to standardize content
- 43 with `_source_value` to preserve original data

1 Open Community Data Standard



OMOP CDM Data Sources

The OMOP Common Data Model is an open community data standard, freely available to anyone who would like to standardize their patient-level data into a format that makes it easier to perform analyses and generate reliable evidence. OHDSI prides itself on stewarding the OMOP Common Data Model as a community resource, and actively encourages its adoption through various workgroups, open-source tool development, and educational sessions, and collaborative support.

There are currently 544 data sources that come from 54 different countries which have been standardized to the OMOP Common Data Model. These data sources contain a range of patient-level observations from various data capture processes within routine clinical care, including electronic health records, administrative claims, registries, hospital systems, genomics and biobanks. Together, these data sources conservatively cover more than 974 million unique patient records, representing approximately 12% of the world's population.

- Australia (16)**
AOA National Joint Replacement Registry
AU-ePBRN (Australian Electronic practice based research network)
AUS Department of Veterans Affairs
Austin Health
IQVIA Australia LPD
Melbourne Childrens Hospital
NPS MedicineWise
Pharmaceutical Benefits Scheme 10% extract
Primary Care GP data (Patron)
Royal Melbourne Hospital and Western Health
Hospital Admissions
South Western Sydney LHD
Sydney Childrens Hospital
Sydney Local Health District (LHD)
University of New South Wales & SPHERE
Maridulu Budjari Gumar
University of Queensland - Queensland Health
University of South Australia
- Austria (1)**
Medical University of Vienna
- Belgium (17)**
Az Damiaan Oostende
AZ Delta
AZ Klina
AZ Maria Middellares
Icometrix
IQVIA Belgium LPD
LinxCare
Medaman
Onze-Lieve-Vrouwziekenhuis Aalst-Asse-
Ninove
THIN BE
Universitaire Ziekenhuizen KU Leuven
University Hospital Antwerp
University MS Center
UZ Brussel
UZ Leuven
VZW AZ Groeninge
Ziekenhuis Oost-Limburg
- Bosnia and Herzegovina (2)**
E-MEDIT D.O.O. & Hospital Travnik
Public Institution Travnik Hospital EHR
- Brazil (4)**
Centre of Health Data and Knowledge
Integration - Cidacs
DataSUS Ambulatory
Hospital Israelita Albert Einstein
IQVIA Brazil
- Bulgaria (2)**
National Scientific Programme "E-Health in Bulgaria"
SAT Health
- Cameroon (1)**
Data Science Without Borders (DSWB) Project,
Douala General Hospital -Respiratory disease unit
- Canada (3)**
IQVIA Canada EMR
Provincial Health Services Authority (British Columbia)
The Hospital for Sick Children
- China (9)**
Beijing Anding Psychiatry Hospital
Beijing Smindu Medical Science & Technology CO., Ltd
Beijing-Tianjin-Hebei (Jing-Jin-Ji) Psychiatric Database
Hebei Province Psychiatry Hospital
Jiangsu Province People's Hospital
Nanfang Hospital COVID-19 Research Database (NFHCRD)
Tianjin Anding Psychiatry Hospital
Wonders Information
Yinzhou Healthcare
- Colombia (1)**
Hospital Universidad del Norte
- Croatia (8)**
Bács-Kiskun Megyei Kórház a Szegedi Tudományegyetem Általános Orvostudományi Kar Oktató Kórháza
- Clinical Hospital Dubrava
Croatian National Healthcare Information System Hierarchy & University Hospital Centre Zagreb IGEA d.o.o. & University Hospital Center Sestre milosrdnice
IN2 d.o.o. & Clinical Hospital Center Osijek
MCS Grupa d.o.o. & Health Care Center of Primorje-Gorski Kotar County
Szabolcs-Szatmár-Bereg Megyei Kórházak és Egyetemi Oktatókórház
- Czechia (3)**
Czech Myeloma Group
Institute of Rheumatology
OAKS Consulting s.r.o.
- Denmark (4)**
Aarhus University Hospital Database
Center for Surgical Science (CSS)
Rigshospitalet, Copenhagen University
DALY-CARE
University of Southern Denmark
- Estonia (3)**
Estonian Biobank
Estonian Genome Center at the University of Tartu (EGCUT)
University of Tartu
- Ethiopia (2)**
Northwest Ethiopia health facility linked community based study
Data Science Without Borders (DSWB) Project,
AHRI & Hararge Health Demographic Surveillance System
- Finland (11)**
Auria Clinical Informatics
BCB Medical Ltd.
Finnish Clinical Biobank Tampere
Finnish Hematology Registry/ HUS
Finnish Institute for Health and Welfare (THL)
Hospital District of Helsinki and Uusimaa
Hospital District of Southwest Finland
HUS Datalake eCareforMe POC
Pirkanmaa Hospital District
PSHP Oncology
University of Turku (Prostate Cancer Registry of South West Finland)
- France (15)**
APHP-EDS
Assistance Publique - Hôpitaux de Marseille
Assistance Publique – Hôpitaux de Paris (AP-HP)
Bordeaux University Hospital
CEGEDIM HEALTH DATA
Centre Hospitalier Universitaire de Lille
Centre Hospitalier Universitaire de Montpellier
Centre Hospitalier Universitaire de Toulouse
Codoc
IQVIA France DA
IQVIA France LPD
Lille University Hospital
PHAST
SNDS
THIN FR
- Georgia (1)**
Telavi Regional Hospital
- Germany (13)**
CancerDataNet GmbH
Charité - Universitätsmedizin Berlin
European Rare Kidney Disease Registry (ERKReg)
German Cancer Society (DKG)
GermanOncology
Hanover Medical School, Germany
InGeF - Institute for Applied Health Research Berlin GmbH
IQVIA Germany DA
Krebsregister Rheinland-Pfalz
MS Forschungs- und Projektentwicklungs-GmbH
UKER
University Medicine Dresden
University of Ulm, ZIBMT
- Greece (6)**
Diagnostic & Therapeutic Center Of Athens
"Hygeia" Single Member Societe Anonyme
- Digital Health Solutions SA
General Hospital of Kavala
Greek National E-prescription Databank
Innovative Medical Research SA
Papageorgiou General Hospital
- Hungary (5)**
Bács-Kiskun Megyei Kórház a Szegedi Tudományegyetem Általános Orvostudományi Kar Oktató Kórháza
National Institute of Health Insurance Fund
Management Hungary
Semmelweis University
Szabolcs-Szatmár-Bereg Megyei Kórházak és Egyetemi Oktatókórház
University of Pécs
- India (1)**
Buddhimed Technologies
- Ireland (1)**
Trinity St James's Cancer Institute, Dublin
- Israel (12)**
Assuta Medical Centers Ltd.
Barzilai Medical Center
Bnai Zion Medical Research Foundation and Infrastructure Development Health Services
Beni-Zion Medical Center
Galilee Medical Center
Hadassah OBCYN
Hillel Yaffe Medical Center
Kineret (Ministry of Health medical center network)
Locwise
Shamir Medical Center
The Directorate of Government Medical Centers at the Israeli Ministry Of Health
Tzafon medical center
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Agenzia regionale di sanità della Toscana (ARS)
AO Card. G. Panico - Center for Neurodegenerative Diseases and Aging Brain
ASL Roma 1
ASST Papa Giovanni XXIII
ATS Bergamo
AUSL Reggio Emilia
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Azienda Ospedaliera Universitaria Integrata Verona
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Basilicata Cancer Registry
Casa di Cura Privata del Policlinico (CCPP)
Fondazione Casa Solliero della Sofferenza
Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico
Fondazione IRCCS Istituto Neurologico Carlo Besta
Fondazione IRCCS Policlinico San Matteo
Fondazione Istituto Nazionale dei Tumori
Fondazione Poliambulanza Istituto Ospedaliero
FONDAZIONE TOSCANA GABRIELE MONASTERIO PER LA RICERCA MEDICA E DI SANITA PUBBLICA (FTGM)
Grande Ospedale Metropolitano "Bianchi-Melacrinò-Morelli"
Inspiro-eri
IQVIA Italy LPD
IRCCS Azienda Ospedaliero-Universitaria di Bologna Policlinico di Sant'Orsola
IRCCS Policlinico San Donato
ISMETT
Modena Oncology Center - Azienda Ospedaliera Modena
Monastario Foundation (ARCA)
Pedianet
Società Italiana di Medicina Generale e delle cure Primarie (SIMG)
THIN IT
University Hospital of Parma
- Japan (4)**
IQVIA Japan Claims
- IQVIA Japan HIS
Japan Medical Data Center (JMD-C)
MDV (Medical Data Vision)
- Kenya (4)**
APHRC COVID-19 SERO SURVEY
ALPHA Network DB
INDEPTH Core Microdataset
INSPIRE network COVID-19 PEACH database
- Luxembourg (1)**
Registre National du Cancer du Luxembourg
- Malawi (1)**
INSPIRE network COVID-19 PEACH database
- Montenegro (1)**
Clinical Center of Montenegro
- New Zealand (1)**
University of Canterbury
- Netherlands (17)**
Amsterdam UMC
EBMT: The European Society for Blood and Marrow Transplantation
European Clinical Research Alliance on Infectious Diseases (ECRAID) and University Medical Center Utrecht (UMCU)
Harm Slipper
IKM
Integrated Primary Care Information (IPCI)
Lage Landen Foundation
National Intensive Care Evaluation foundation
Netherlands Cancer Registry
NICE
Pharmo
POS-VAP
Pulse
PulseHandWrist
Stichting Vumc
STIZON
VieCuri Medisch Centrum
- Norway (2)**
The Norwegian Cancer Registry
University Of Oslo
- Philippines (1)**
UP-PGH Integrated Surgical Information System
- Portugal (12)**
ADPP
Centro Clínico Académico a Braga, Associação (2CA-Braga)
Centro Hospitalar Universitário de Coimbra (CHUC)
CUF
EGAS MONIZ HEALTH ALLIANCE
Hospital da Luz Learning Health
Hospital Distrital de Santarém (HDS)
Hospital do Espírito Santo de Évora
Instituto de Medicina Molecular
Promptly Patient-reported Outcomes Database
Registo Portugues de Doentes Reumáticos
Unidade Local de Saúde de Matosinhos
- Republic of Korea (64)**
Ajou University Hospital
Asan Medical Center
Bucheon Sejong Hospital
Catholic Kwandong University International ST. Mary's Hospital
Cha University Bundang Medical Center
Chonnam National University Hwasun Hospital
Chonnam National University Hospital
Chungnam National University Hospital
Chungnam National University Sejong Hospital
Daegu Catholic University Medical Center
Dankook University Hospital
Dongguk University Medical Center
Ewha Womens University Medical Center (Mokdong)
Ewha Womens University Medical Center (Seoul)
Gachon University Gil Medical CenterGachon University Gil Medical Center
Gangnam Severance Hospital
Gangneung Ansan Hospital
Gyeongsang National University Changwon Hospital
Gyeongsang National University Hospital

OMOP CDM Adoption Map

Hanyang University Seoul Hospital
Health Insurance Review & Assessment Service
Incheon Sejong Hospital
Inha University Hospital
Jeonbuk National University Hospital
Kangbuk Samsung Hospital
Kangdong Sacred Heart Hospital
Kangwon National University Hospital
Keimyung University Daegu Dongsan Hospital
Keimyung University Dongsan Medical Center
Konkuk University Medical Center
Konyang University Hospital
Korea Institute of Radiological & Medical Sciences
Korea University Anam Hospital
Korea University Ansan Hospital
Korea University Guro Hospital
Kyung Hee University Hospital At Gangdong
Kyung Hee University Medical Center
Kyungpook National University Chilgok Hospital
Kyungpook National University Hospital
Myongji Hospital
Myongji Hospital (Jecheon)
National Cancer Center
National Health Insurance Service
National Health Insurance Service Ilsan Hospital
Presbyterian Medical Center
Pusan National University Hospital
Samsung Medical Center
Seoul National University Bundang Hospital
Seoul National University Hospital
Severance Hospital
SMG-SNU Boramae Medical Center
Soonchunhyang University Hospital (Bucheon)
Soonchunhyang University Hospital (Chonan)
Soonchunhyang University Hospital (Gumi)
Soonchunhyang University Hospital (Seoul)
The Catholic Univ. of Korea, Eunpyeong ST. Mary's Hospital
The Catholic University of Korea, Seoul ST. Mary's Hospital
The Catholic University of Korea, ST. Vincent's Hospital
The Catholic University of Korea, Uijeongbu ST. Mary's Hospital
The Catholic University of Korea, Yeouido ST. Mary's Hospital
Ulsan University Hospital
Wonju Severance Christian Hospital
Wonkwang University Hospital
Yongin Severance Hospital

Romania (1)
Thin Ro

Rwanda (1)
LAISDAR Network Rwanda

Saudi Arabia (1)
Saudi Food and Drug Authority

Scotland (3)
DataLoch
HIC Dundee
South East Scotland Database

Senegal (1)
Data Science Without Borders (DSWB) Project, IRESSEF-Advanced HIV Disease

Serbia (5)
Clinical-hospital center Zvezdara
Kliničko-bolnički centar Zvezdara (Clinical-hospital center Zvezdara)
Primary Healthcare Center Zemun
University Clinical Center of Niš
University Clinical Center of Serbia

Singapore (3)
Growing Up in Singapore Towards healthy Outcomes (GUSTO)
Khoo Teck Puat Hospital (SG_KTPH)
National University Hospital Singapore

South Africa (2)
National Income Dynamics Study (NIDS)
Health & Aging in Africa

Spain (40)
Agencia Española de Medicamentos y Productos Sanitarios, AEMPS
BIFAP (Base de datos para la Investigación Farmacoepidemiológica en el Ambiente Público)
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Consorti Corporació Sanitària Parc Taulí
Consorti Mar Parc de Salut de Barcelona (PSMAR)
CORPORACIÓ SANITARIA PARC TAULÍ FISABIO-HSRU
Fundació Institut d'Investigació Sanitària Illes Balears
Fundació Institut d'Investigacions Mèdiques (FIMIM)
Fundación de Investigación Biomedica del Hospital Universitario 12 de Octubre
Fundación para la Investigación Biomedica INCLIVA
Fundación para la Investigación del Hospital Universitario La Fe de la Comunidad Valenciana (HULAFE)
Fundación para la Investigación e Innovación Biosanitaria en Atención Primaria (FIIBAP)
Healthcare Service of the Principality of Asturias
Helios Healthcare Spain, S.L.U.
HM Hospitals
Hospital del Mar (HMAR)
Hospital de la Santa Creu i Sant Pau
Hospital Sant Joan de Déu
Hospital Universitario 12 de Octubre

INFOBANCO12
Information System of Parc de Salut Mar (IMASIS)
Institut Català d'Oncologia
Instituto Aragonés de Ciencias de la Salud (IACS)
IQVIA Spain LPD
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Parc Sanitari Sant Joan de Déu
Pedro Mallol
Research Institute - Hospital de la Santa Creu i Sant Pau
Rioja Salud
Servicio Cántabro de Salud and IDIVAL
Servei Català de la Salut
Servicio Madrileño de Salud
Servicio Navarro de Salud Osasunbidea (SNS-O)
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The Information System for Research in Primary Care - Hospitalization Linked Data (SIDIA-PH)
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Switzerland (6)
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Data2time
Geneva Cancer Registry
HUG and SCQM
Institute of Social and Preventive Medicine, University of Bern
Vaud Cancer Registry

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Taichung Veterans General Hospital EHR
Taipei Medical University Clinical Research Database (TMUCRD)
Taipei Medical University Hospital
Wanfong Hospital

Thailand (1)
Siriraj Hospital EHR

Turkey (4)
Bayindir Healthcare Group
HIS
Istanbul University Istanbul Faculty of Medicine
IUC Cerrahpaşa TIP Fakültesi

Uganda (2)
Iganga Mental Health primary data
Kagame Mental Health primary data

Ukraine (1)
National Cancer Institute

United Kingdom (26)
Akrivia Health
Barts Health NHS Trust
Clinical Practice Research Datalink (CPRD GOLD)
Clinical Practice Research Datalink Aurum (CPRD Aurum)
Connected Bradford
DataLoch
GOSH
Harvey Walsh Ltd
Health Informatics Centre
King's College London
Leeds Teaching Hospitals
OPEN Health
Optimum Patient Care Limited
Queen Mary University of London
Royal College of General Practitioners Research and Surveillance Centre
SAIL Databank
SciBite TERMite
THIN UK
UCL
UK Biobank
UK Integrated Medical Record Database

(IMRD) THIN
UK National Neonatal Research Database
UKCRIS
University College London CALIBER
University College London Hospitals
University of Edinburgh

United States (154)

1up health
Advocate Aurora Health & University of Madison Health Non-Muscle Invasive Bladder Cancer
Advocate Aurora Health COVID Database
Aetna Medical and Pharmacy Data Warehouse
All of Us Research Program
ALTAMED (University of Southern California)
Atrium - Wake Forest Baptist Health
Axiom Health
Baylor Medicine EHR
Blue Health Intelligence
Boston Medical Center
Brown University - Rhode Island HIE
C-Path
Carilion Clinic
Case Western
Cerner HealthFacts
Cherokee Health Systems
Children's Hospital of Colorado
Children's Hospital of Los Angeles
Children's Hospital of Philadelphia
Children's National
Cincinnati Children's Hospital Medical Center
Columbia University Irving Medical Center
Covenant Physician Partners
CRHFEI
Dana-Farber Cancer Institute
DARTNet Institute: CER2 Study
Decision Resources Group (DRG)
Department of Health Services - Los Angeles
Duke University
Eau Claire Cooperative Health Center
Emory Enterprise Research Repository
Fairview Health System EHR
Flatiron - OSCER
Geisinger Health System
George Washington University
Georgetown University ARIA
Georgia Tech Research Institute
GeniOMOP
Harvard University Mass General Brigham
HealthPartners Institute
HealthVerity
Helix Clinico-Genomics Database
Helix Research Network
Merative MarketScan(R) Commercial Claims (CCAE)
Merative MarketScan(R) Medicare Supplemental Database (MDCR)
Merative MarketScan(R) Multi-State Medicaid Database (MDCD)
Icahn School of Medicine at Mount Sinai
Indiana University School of Medicine / Regenstrief Institute
Inova Health System
IQVIA US Ambulatory EMR
IQVIA US Hospital Charge Data Master (CDM)
IQVIA US Oncology EMR
IQVIA US Open Claims
IQVIA US PharMetrics Plus
Johns Hopkins University
Keck Medicine of University of Southern California
Loyola University New Orleans
Lurie
Maine Medical Center
Marietta Eye Clinic EHR
Mayo Clinic
Medical University of South Carolina
Medicare Research Identifiable Files
MedStar Health
Memorial Sloan Kettering Cancer Center
Momentum AD
Montefiore Medical Center (Albert Einstein College of Medicine)
N3C
Nemours Children's Health System
NeuroBlu Behavioral Health Database
NorthShore University HealthSystem
Northwestern Medical Enterprise Data Warehouse (NMEMDW)
NYC-CDRN
NYU Langone

OCHIN (Oregon Community Health Information Network)
Ochsner Medical Center
Oklahoma University
One Fact Foundation Payless Health
Optum® De-Identified Clinformatics(R) Data Mart Database - SES & DOD
Optum® de-identified Electronic Health Record Dataset (PANTHER)
Oregon Health & Science University
Pareto Intelligence
PEDSnet
Penn State
Premier Healthcare Database
QueensCare - Los Angeles
Reliant Medical Group
Rhode Island Quality Institute
Rush University Medical Center
Rutgers
Shriners Children's
Spectrum Health West Michigan
STAnford medicine Research data Repository (STARR)
Stony Brook
Surveillance, Epidemiology, and End Results Program (SEER): B-Cell
TCC - Los Angeles
The Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS)
The National Health and Nutrition Examination Survey (NHANES)
The Ohio State University Medical Center
TrialSpark
Tufts MC Research Data Warehouse (TRDW)
Tulane
UMass Memorial Medical Center
UNC Chapel Hill
University Medical Center New Orleans
University of Alabama at Birmingham
University of Arkansas
University of Buffalo
University of California Health
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, Riverside
University of California, San Diego
University of California, San Francisco
University of Chicago
University of Cincinnati
University of Colorado
University of Colorado, Anschutz Medical Center
University of Illinois Chicago
University of Iowa
University of Kentucky
University of Miami
University of Michigan
University of Minnesota
University of Mississippi Medical Center
University of Nebraska Medical Center
University of New Mexico Health Sciences Center
University of North Carolina, Chapel Hill
University of Pennsylvania
University of Pittsburgh
University of Pittsburgh - Banner
University of Rochester
University of Texas Houston
University of Texas Medical Branch
University of Texas Southwestern Medical Center
University of Utah
University of Virginia
University of Washington
University of Wisconsin Madison
US Department of Defense
US Department of Veterans Affairs
UTPhysicians
Vanderbilt University
Veradigm Health Insights Data - Allscripts
Veradigm Health Insights Data - Practice Fusion
Virginia Commonwealth University
Wake Forest University
WashU St Louis
Weill Cornell Medicine/NewYork-Presbyterian Hospital (East Campus)
West Virginia University
Winship Cancer Institute of Emory University
Zus Health

OHDSI Evidence Network

In the last few pages, you learned about the OMOP Common Data Model, our foundational tool which standardizes patient-level data. You saw the reach of OMOP, which connects nearly one billion patients across six different continents in a way no other community can match.

However, if we aren't using this data to make an impact, we are wasting an incredible resource.

That is why we are building the OHDSI Evidence Network. We are giving researchers faster access to real-world data. This has been a priority over the last year, and it will remain one for the foreseeable future. We share a responsibility to empower network studies so they can generate reliable real-world evidence.

Several OMOP data sources have already joined the Evidence Network, and a few shared their experience in these pages. We encourage you to join them and help shape the future of healthcare decision-making.

The OHDSI Evidence Network is a collaborative initiative designed to improve health outcomes globally by uniting data partner organizations and researchers dedicated to generating evidence to support health decisions.

By joining this network, data partners have the opportunity to participate in studies that enhance data quality, improve vocabulary representation, and address the challenges of studying rare conditions and exposures. The network fosters standardized methodologies and rapid cycle analyses, all supported by the OMOP CDM. With a strong commitment to privacy and ethical standards, OHDSI ensures that personal information remains confidential while allowing partners full control over their participation in research projects.

Becoming a part of the OHDSI Evidence Network offers numerous benefits. Data partners participate in a collaborative environment that enriches evidence generation and supports diverse representation in health data. The network provides valuable opportunities for funding, career development, and business partnerships, creating a supportive ecosystem for all members.

By joining the OHDSI Evidence Network, data partners not only amplify their own research capabilities but also contribute to a collective mission aimed at transforming health care and improving patient outcomes around the world.

To join, simply generate a database profile and share it with the OHDSI Coordinating Center by following the instructions found on the GitHub below.



If you have questions, please fill out our interest form below. A community member will reach out to support your efforts.



Testimonials From Collaborators Who Have Joined The OHDSI Evidence Network



Joining the OHDSI Evidence Network was important to me because it allows us to increase the diversity of patient populations represented in the network, particularly from the Midwest U.S., which is currently under-represented. I believe that the methods developed by OHDSI can enhance care and improve patient health within my local healthcare system. The process to join was straightforward, thanks to OHDSI's collaborative and open-source community, with ample support through documentation, forums, and workgroup calls. By being part of the network, I hope to engage more data partners so we can tackle challenging clinical problems together, such as rare diseases and rare adverse drug reactions, which are often impossible to address with a single database.

Linying Zhang

Assistant Professor of Biostatistics at the Institute for Informatics, Data Science, & Biostatistics
Washington University School of Medicine in St. Louis



HealthPartners Institute was motivated to join the OHDSI Evidence Network to collaborate with organizations around the world and contribute to research that can promote better health and improve care – both locally and on a global scale. Prior to joining, we secured leadership buy-in, IRB approval, and limited funding to support our participation. We felt very supported throughout the process of joining the Evidence Network, and the OHDSI staff were helpful and responsive to questions we had along the way. We look forward to building relationships with other members and participating in workgroups to make meaningful contributions to research in the future.

Sam Patnoe

Senior Programmer Analyst, Research Informatics
HealthPartners Institute



The OHDSI community is a well-organized and highly welcoming community of experts who have helped me grow throughout my career. I was honored to bring European data into the OHDSI Evidence Network because of the importance of a diverse patient population for our global studies. As expected, the support and guidance I received from the community made the process both simple and fulfilling. Heliant Health, along with its data partners in the Balkans region, looks forward to joining this critical initiative and generate the necessary evidence to improve healthcare.

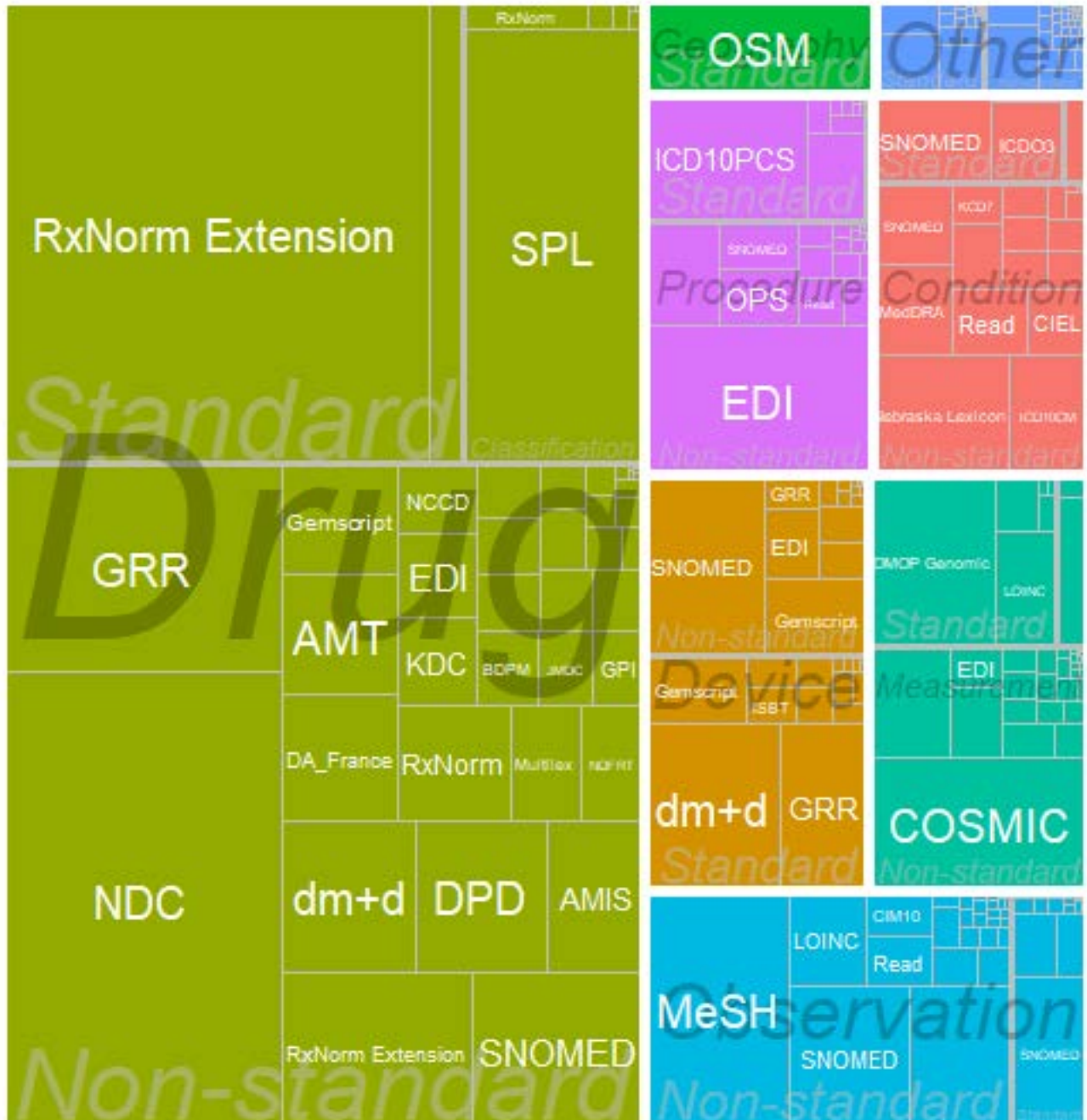
Filip Maljković

Core tech lead
Heliant Health

OHDSI Standardized Vocabularies

The OHDSI vocabularies allow organization and standardization of medical terms to be used across the various clinical domains of the OMOP common data model, and enables standardized analytics that leverage the knowledge base when constructing exposure and outcome phenotypes and other features within characterization, population-level effect estimation, and patient-level prediction studies.

You can download the OHDSI Standardized Vocabularies at athena.ohdsi.org.



This treemap shows all concepts in the OHDSI vocabularies, organized by domain (color) and vocabularies (boxes sized by the number of concepts).

OHDSI Vocabularies By The Numbers

as of August 2024 release

- 11,561,982 concepts
 - 3,720,296 standard concepts
 - 883,766 classification concepts
- 143 vocabularies
- 43 domains
- 86,668,674 concept relationships
- 99,192,928 ancestral relationships
- 5,009,796 concept synonyms

1 Shared Resource to Enable Data Standards

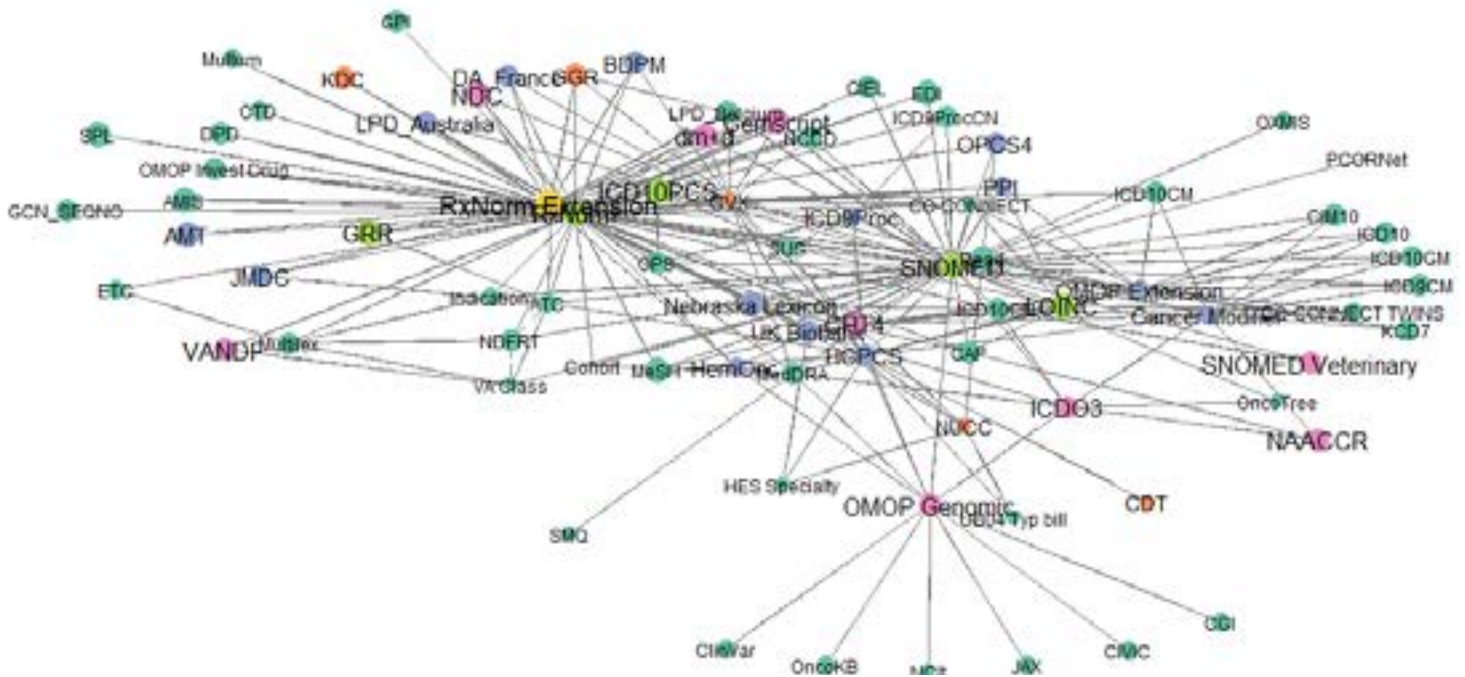
This network diagram shows the relationships between vocabularies. Nodes are vocabularies, sized by the number of concepts. Edges show connections between concepts within vocabularies.

Want to learn more about the OHDSI vocabularies?

Read: book.ohdsi.org

Download: athena.ohdsi.org

Learn: academy.ehden.edu



“If we really want to achieve global collaboration, we need more than just standardizing data format. We have to establish a shared understanding of data meaning and speak the same language when expressing clinical ideas. The OHDSI vocabularies is a community resource that makes it possible to work to reach this common goal.”

- Christian Reich

2018 Titan Award recipient for Data Standards

OHDSI Standardized Vocabularies Improvement Initiative

Continuous improvement of our standardized vocabularies has been a community effort over the last year. Recent focuses have included contributions, versioning, and building a roadmap with emphasis on vocabularies most commonly used.

We thank our Vocabulary Team for its leadership in this journey. Learn more about recent developments on these pages.

2024-25 Vocabulary Roadmap



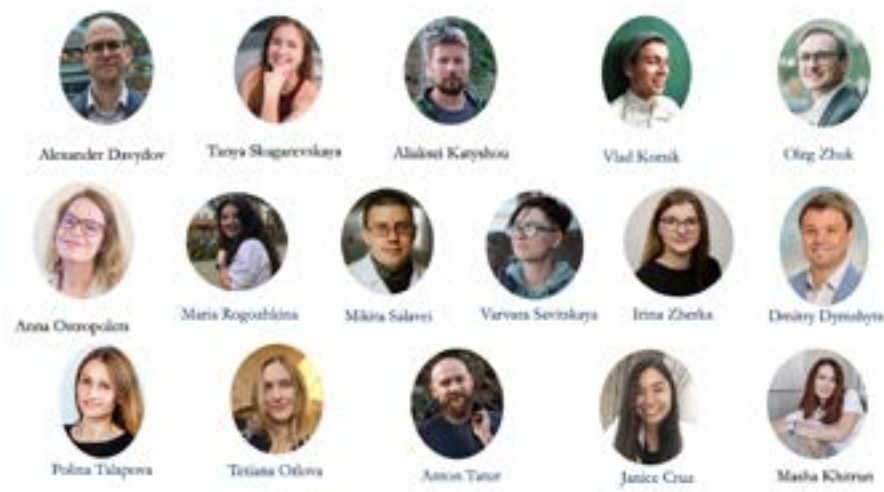
Check Out The Roadmap

Scholarship Meets Application

We published principles for standardized vocabularies and have developed quality compliance checks to monitor progress

Requirement	Definition
Standard concepts	Unique concepts of fully pre-coordinated medical entities, to be stated as fact, no negations of facts, no reference to the past, and no flavors of null (unknown, not reported, etc.)
Concept domains	Assignment of concepts to domain categories (condition, drug, visit, etc.)
Comprehensive coverage	In each domain, standard concepts must cover all possible entities and mappings from terms and codes used in databases around the world
Polymorphics	Prevaluated hierarchies organizing concepts
Efficiency	Computationally efficient data model
The use focus	Storing and analyzing patient level data for evidence generation

Thank You, Vocabulary Team!



JAMIA Publication



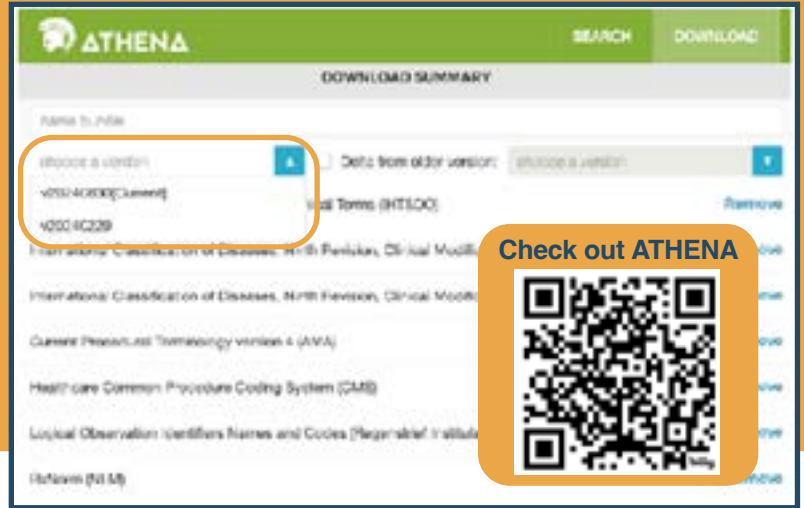
Quality Management System



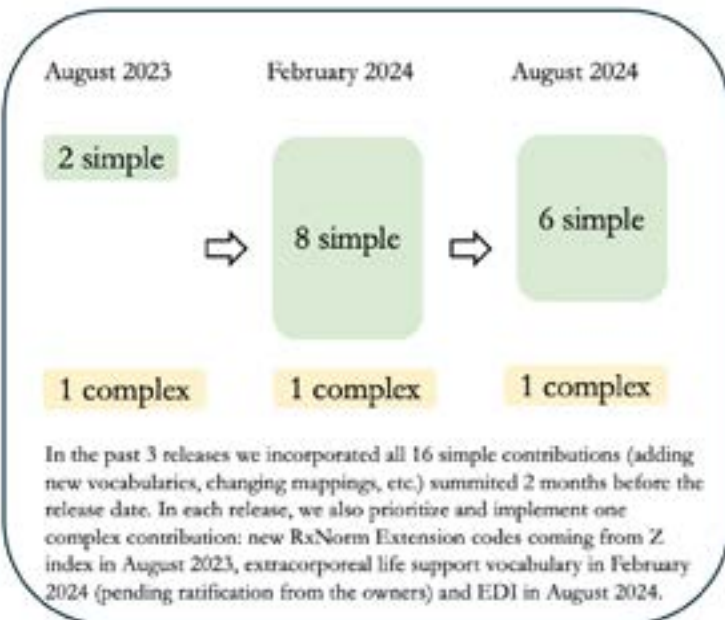
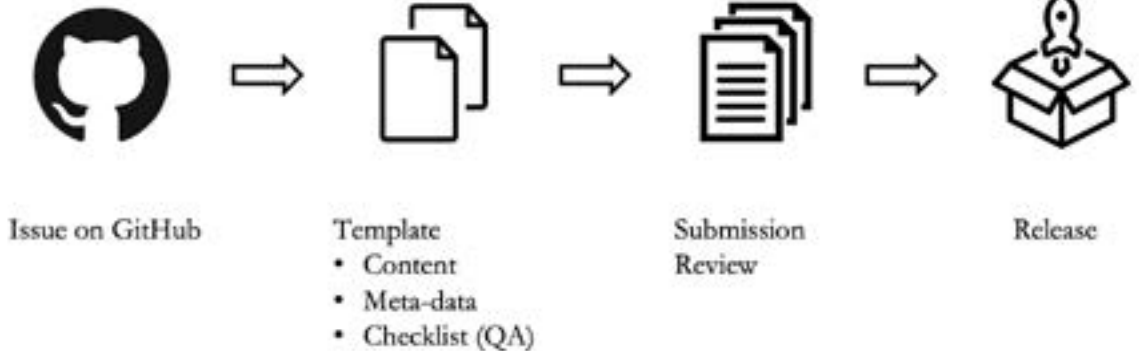
Community-Inspired Development

One of the most commonly requested features in the landscape assessment was enabling users to download different versions of the vocabularies.

The feature now is available on athena.ohdsi.org.



Community Contributions



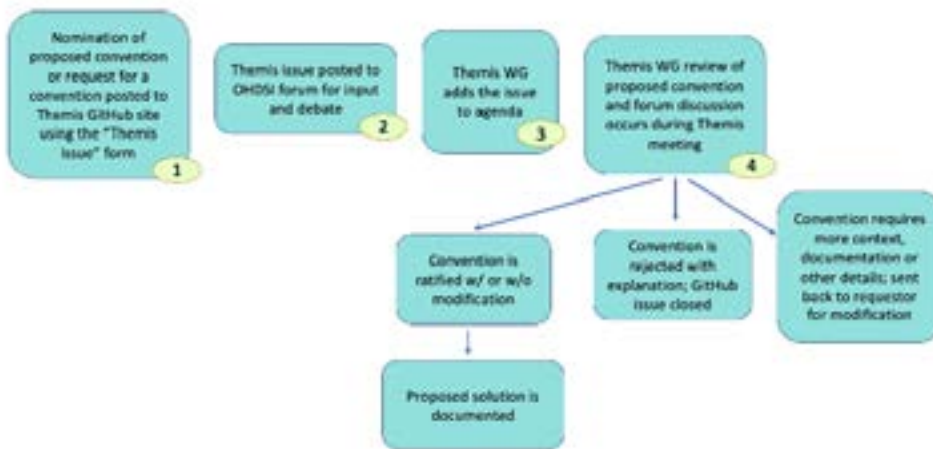
Themis Conventions

The Themis Repository contains all ratified conventions for the OHDSI community and was established during the April Olympians activity highlighted on page 37. Throughout this month-long event, the Olympians successfully added 25 ratified Themis conventions to the newly launched website; you can see the various convention categories below.

However, our work continues. The Themis workgroup remains actively engaged in reviewing issues, discussing proposals, and adjudicating conventions. Our goal is to guide the OHDSI community on how to accurately insert data into the OMOP CDM in cases of ambiguity.

This ongoing effort supports the creation of a structurally standardized and semantically harmonized data model, ultimately contributing to the production of reliable real-world evidence to inform patient care. All are welcome to join Themis!

Topic Processing



Find the conventions on the Themis homepage

General Conventions: Person Exclusion, Gender Identity, Providers with Multiple Addresses, Records with Values, Patient Reported Data, Events Outside of the Observation Period, Observation Periods for EHR data

CDM Tables: Care Site, Condition Occurrence, Death, Drug Exposure, Location, Measurement, Observation Period, Person, Provider, Visit Occurrence

Tag Browser: Address, Birthdate, Dates, Gender, Gender Identity, Labs, Lab Values, Location, Measurement, Negative, Observation Period, Patient Reported, Person, Place of Service, Provider Quantity, Sex, Themis, Value as Number, Year of Birth



“Themis makes decisions for the good of the whole community. We must compromise. Don’t let perfect be the enemy of great. And interoperability between different OMOP CDMs is great!”

- Melanie Philofsky

2022 Titan Award recipient for Data Standards

OMOP and FHIR

When the OMOP CDM and FHIR (a healthcare data exchange standard) work together, they improve healthcare data sharing and research. OMOP organizes large amounts of patient data from different sources, while FHIR ensures secure and standardized data exchange between systems. Combining the two allows researchers and healthcare providers to access and use patient data more efficiently, improving precision medicine, personalized treatments, and overall patient care. It also enhances collaboration across hospitals, research institutions, and healthcare technologies, leading to better outcomes and innovations in medical care.

At OHDSI, we are FHIR-ed up!

In 2021, HL7 and OHDSI established a memorandum of agreement together. Under this cooperative agreement, a focused effort was launched to align the FHIR and OMOP models to support consistent data transformation for implementations using either model.

We have made exciting progress over the last year, starting with a successful connection at the 2023 OHDSI Global Symposium. During that event, attendees used two different software applications to transform FHIR data to OMOP, and vice versa.

The OMOP + FHIR workgroup has made steady progress to achieve its 2024 objectives. In cooperation with the HL7 Vulcan FHIR Accelerator, new leaders joined weekly efforts to advance standards that leverage both FHIR and OMOP, adding HL7 experts with diverse backgrounds to the blended leadership group.

Representatives from more than 60 organizations have attended bi-weekly meetings focused on development of an implementation guide detailing standard concept mapping for transforming FHIR to OMOP for core data elements. With the OMOP + FHIR WG, Vulcan is sponsoring co-development of an implementation guide for high-value transformations for common, core EHR clinical content from FHIR to OMOP. The resulting guide will address:

- Need to consistently and effectively transform FHIR EHR data onto the OMOP CDM
- Decreased site data transformation costs
- Increasing the quality & consistency of the data produced using the specification

Additionally, in collaboration with the HL7 Health Equity Working Group, the OMOP + FHIR WG leads

launched a project to update the OMOP CDM to align it with new conventions for Gender Identity and administrative sex represented by the HL7 Gender Harmony Implementation Guide and United States Core Data for Interoperability (USCDI) standards.



VII.

Open-Source Software

CohortMethod New-user cohort studies using large-scale regression for propensity and outcome models. Learn more...	SelfControlledCaseSeries Self-Controlled Case Series analysis using few or many predictors, includes splines for age and seasonality. Learn more...	Cyclops Highly efficient implementation of regularized logistic, Poisson and Cox regression. Learn more...	DatabaseConnector Connect directly to a wide range of database platforms, including SQL Server, Oracle, and PostgreSQL. Learn more...	SqlRender Generate SQL on the fly for the various SQL dialects. Learn more...
SelfControlledCohort A self-controlled cohort design, where time preceding exposure is used as control. Learn more...	EvidenceSynthesis Routines for combining causal effect estimates and study diagnostics across multiple data sites in a distributed study. Learn more...	ParallelLogger Support for parallel computation with logging to console, disk, or e-mail. Learn more...	FeatureExtraction Automatically extract large sets of features for user-specified cohorts using data in the CDM. Learn more...	Andromeda Storing very large data objects on a local drive, while still making it possible to manipulate the data in an efficient manner. Learn more...
PatientLevelPrediction Build and evaluate predictive models for user-specified outcomes, using a wide array of machine learning algorithms. Learn more...	EmpiricalCalibration Use negative control exposure-outcome pairs to profile and calibrate a particular analysis design. Learn more...	BigKnn A large scale k-nearest neighbor classifier using the Lucene search engine. Learn more...	ROhdsWebApi Interact with OHDSI WebAPI web services. Learn more...	OhdsiSharing Securely sharing (large) files between OHDSI collaborators. Learn more...
MethodEvaluation Use real data and established	CohortDiagnostics Generate a wide set of diagnostics to	Hydra Hydrating package skeletons into	Economia A standard CDM dataset for testing	CirceR An R wrapper for Circe, a library for

HADES

HADES is a set of open source R packages for large scale analytics, including population characterization, population-level causal effect estimation, and patient-level prediction.

The packages offer R functions that together can be used to perform an observational study through the full journey from data to evidence, including data manipulation, statistical modeling, and results generation with supporting statistics, tables and figures.

Each package includes functions for specifying and subsequently executing multiple analyses efficiently. HADES supports best practices for use of observational data as learned from previous and ongoing research, such as transparency and reproducibility, as well as measuring of the operating characteristics of methods in a particular context and subsequent empirical calibration of estimates produced by the methods.

Learn more about the individual HADES packages in this section.

Population-Level Estimation

CohortMethod

CohortMethod is an R package for performing new-user cohort studies in an observational database in the OMOP Common Data Model.

EvidenceSynthesis

This R package contains routines for combining causal effect estimates and study diagnostics across multiple data sites in a distributed study. This includes functions for performing meta-analysis and forest plots.

SelfControlledCaseSeries

SelfControlledCaseSeries is an R package for performing Self-Controlled Case Series (SCCS) analyses in an observational database in the OMOP Common Data Model.

SelfControlledCohort

This package provides a method to estimate risk by comparing time exposed with time unexposed among the exposed cohort.

Characterization/Patient-Level Prediction

Characterization

Characterization is an R package for performing characterization of a target and a comparator cohort.

CohortIncidence

CohortIncidence is an R package and Java library for calculating incidence rates on the OMOP CDM.

DeepPatientLevelPrediction

DeepPatientLevelPrediction is an R package for building and validating deep learning patient-level predictive models using data in the OMOP Common Data Model format and OHDSI PatientLevelPrediction framework.

EnsemblePatientLevelPrediction

EnsemblePatientLevelPrediction is an R package for building and validating ensemble patient-level predictive models using data in the OMOP Common Data Model format. The package expands the OHDSI R PatientLevelPrediction package to enable ensemble learning.

PatientLevelPrediction

PatientLevelPrediction is an R package for building and validating patient-level predictive models using data in the OMOP Common Data Model format.

Cohort Construction

Capr

The goal of Capr, pronounced ‘kay-pr’ like the edible flower, is to provide a language for expressing OHDSI Cohort definitions in R code. OHDSI defines a cohort as “a set of persons who satisfy one or more inclusion criteria for a duration of time” and provides a standardized approach for defining them (Circe-be). Capr exposes the standardized approach to cohort building through a programmatic interface in R which is particularly helpful when creating a large number of similar cohorts. Capr version 2 introduces a new user interface designed for readability with the goal that Capr code being a human readable description of a cohort while also being executable on an OMOP Common Data Model.

CirceR

CirceR, a R-wrapper for Circe, is a library for creating queries for the OMOP Common Data Model. These queries are used in cohort definitions (CohortExpression) as well as custom features (CriteriaFeature). This package provides convenient wrappers for Circe functions, and includes the necessary Java dependencies.

CohortDiagnostics

CohortDiagnostics is an R utility package for the development and evaluation of phenotype algorithms for OMOP CDM compliant data sets. This package provides a standard, end to end, set of analytics for understanding patient capture including data generation and result exploration through an R Shiny interface. Analytics computed include cohort characteristics, record counts, index event misclassification, captured observation windows and basic incidence proportions for age, gender and calendar year. Through the identification of errors, CohortDiagnostics enables the comparison of multiple candidate cohort definitions across one or more data sources, facilitating reproducible research.

CohortExplorer

This software tool is designed to extract data from a randomized subset of individuals within a cohort and make it available for exploration in a ‘Shiny’ application environment. It retrieves date-stamped, event-level records from one or more data sources that represent patient data in the OMOP data model format. This tool features a user-friendly interface that enables users to efficiently explore the extracted profiles, thereby facilitating applications, such as reviewing structured profiles. The output of this R-package is a self-contained R shiny that contains person-level data for review.

CohortGenerator

This R package contains functions for generating cohorts using data in the CDM.

Knowledge-Enhanced Electronic Profile Review (KEEPER)

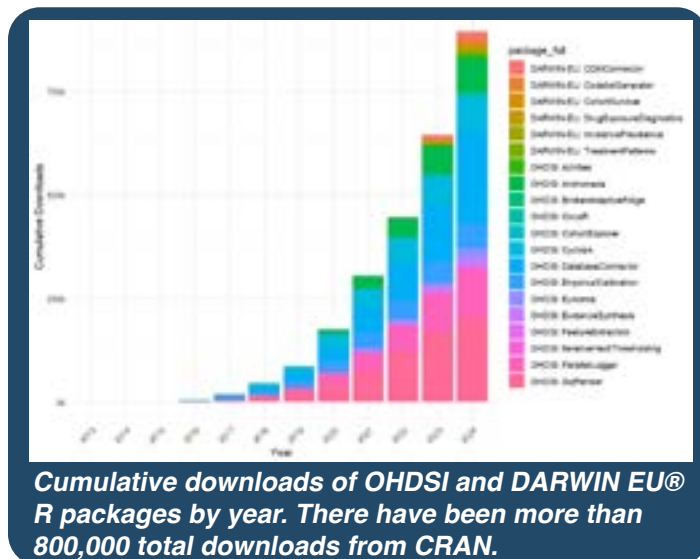
KEEPER is an R package for reviewing patient profiles for phenotype validation.

PheValuator

The goal of PheValuator is to produce a large cohort of subjects each with a predicted probability for a specified health outcome of interest (HOI). This is achieved by developing a diagnostic predictive model for the HOI using the PatientLevelPrediction (PLP) R package and applying the model to a large, randomly selected population. These subjects can be used to test one or more phenotype algorithms.

PhenotypeLibrary

The OHDSI community has developed a publicly accessible, version-controlled Phenotype Library to guide real-world evidence towards the FAIR principles: Findability, Accessibility, Reproducibility, and Interoperability. This library aims to foster the submission and retrieval of high-quality cohort definitions, cataloging of metadata, attribution and promotion of discovery and reuse in scientific research. Within the OHDSI Phenotype Library (OHDSI PL), each entry represents a unique cohort definition identifiable by a stable, externally referenceable ID. Comprehensive metadata about each cohort definition is cataloged and made searchable for researchers. Content in the library is subject to version control, with each version is assigned a specific DOI.



Evidence Quality

Achilles

Automated Characterization of Health Information at Large-Scale Longitudinal Evidence Systems (ACHILLES) Achilles provides descriptive statistics on an OMOP CDM database. ACHILLES currently supports CDM version 5.3 and 5.4.

Data Quality Dashboard

The goal of the Data Quality Dashboard (DQD) project is to design and develop an open-source tool to expose and evaluate observational data quality. This package will run a series of data quality checks against an OMOP CDM instance (currently supports v5.4, v5.3 and v5.2). It systematically runs the checks, evaluates the checks against some pre-specified threshold, and then communicates what was done in a transparent and easily understandable way.

Empirical Calibration

This R package contains routines for performing empirical calibration of observational study estimates. By using a set of negative control hypotheses we can estimate the empirical null distribution of a particular observational study setup. This empirical null distribution can be used to

compute a calibrated p-value, which reflects the probability of observing an estimated effect size when the null hypothesis is true taking both random and systematic error into account, as described in the paper *Interpreting observational studies: why empirical calibration is needed to correct p-values*.

Also supported is empirical calibration of confidence intervals, based on the results for a set of negative and positive controls, as described in the paper *Empirical confidence interval calibration for population-level effect estimation studies in observational healthcare data*.

Method Evaluation

This R package contains resources for the evaluation of the performance of methods that aim to estimate the magnitude (relative risk) of the effect of a drug on an outcome. These resources include reference sets for evaluating methods on real data, as well as functions for inserting simulated effects in real data based on negative control drug-outcome pairs. Further included are functions for the computation of the minimum detectable relative risks and functions for computing performance statistics such as predictive accuracy, error and bias.

Supporting Packages

Andromeda

AsynchroNous Disk-based Representation of Massive DATA (ANDROMEDA): An R package for storing large data objects. Andromeda allow storing data objects on a local drive, while still making it possible to manipulate the data in an efficient manner.

BigKNN

An R package implementing a large scale k-nearest neighbor (KNN) classifier using the Lucene search engine.

BrokenAdaptiveRidge

A R package that approximates best-subset selection (L0) regression with an iteratively adaptive Ridge (L2) penalty for large-scale models, using Cyclops.

Cyclops

Cyclops (Cyclic coordinate descent for logistic, Poisson and survival analysis) is an R package for performing large scale regularized regressions.

DatabaseConnector

This R package provides function for connecting to various

DBMSs. Together with the SqlRender package, the main goal of DatabaseConnector is to provide a uniform interface across database platforms: the same code should run and produce equivalent results, regardless of the database back end.

Eunomia

Eunomia is a standard dataset manager for sample OMOP CDM datasets. Eunomia facilitates access to sample datasets from the EunomiaDatasets repository. Eunomia is used for testing and demonstration purposes, including many of the exercises in the Book of OHDSI.

FeatureExtraction

An R package for generating features (covariates) for a cohort using data in the Common Data Model.

Hydra

An R package and Java library for hydrating package skeletons into executable R study packages based on specifications in JSON format.

Supporting Packages

IterativeHardThresholding

A R package that fits large-scale regression models with a penalty that restricts the maximum number of non-zero regression coefficients to a prespecified value, using Cyclops.

OhdsiSharing

This is an R package for sharing data between OHDSI partners.

OhdsiShinyModules

OhdsiShinyModules is an R package containing Shiny modules that can be used within shiny result interfaces. The OHDSI tools often provide shiny interfaces for viewing and exploring results. Many of these shiny apps have overlapping features. To ensure consistency we have created a repository containing useful shiny modules that can be used in multiple result explorers.

ParallelLogger

Support for parallel computation with progress bar, and option to stop or proceed on errors. Also provides logging to console and disk, and the logging persists in the parallel threads. Additional functions support function call automation with delayed execution (e.g. for executing functions in parallel).

ResultModelManager

RMM is a database data model management utilities for R packages in the Observational Health Data Sciences and Informatics program. RMM provides utility functions to allow package maintainers to migrate existing SQL database models, export and import results in consistent patterns.

ROhdsiWebApi

ROhdsiWebApi is a R based interface to 'WebApi' (OHDSI RESTful services), and performs GET/PULL/POST/DELETE calls via the WebApi. All objects starting from R or output to R - are analysis ready R-objects like list and data.frame. The package handles the intermediary steps by converting R-objects to JSON and vice versa. To ensure r-objects are analysis ready, the objects are type converted where possible, e.g. date/date time are converted from string to POSIXct.

This package makes reproducible research easier, by offering ability to retrieve detailed study specifications, transport study specifications from one instance to another, programmatically invoke the generation of a sequence of steps that are part of a study, manage running studies in batch mode.

ShinyAppBuilder

Create Shiny apps using modules from OhdsiShinyModules or custom modules.

SqlRender

This is an R package for rendering parameterized SQL, and translating it to different SQL dialects. SqlRender can also be used as a stand-alone Java library and a command-line executable.

Kheiron Contributor Cohort

The Kheiron Contributor Cohort has entered its third year, and 12 new members have been accepted into the leadership program with the aim of onboarding new software developers into the OHDSI open-source software community. The Kheiron faculty includes Katy Sadowski, Paul Nagy, Anthony Sena, John Gresh, Hayden Spencer, Kyle Vollo-Zenecek, and Dan Smith. The leadership program kicks off each fall and goes through to the spring OHDSI DevCon event. Developers commit 10% of their time for a year to participate in the open-source journey, working closely with an experienced OHDSI developer who volunteers to assist their mentees in making meaningful contributions to the community. The cohort participates in hands-on workshops, attends Technical Advisory Board meetings, and performs development work in HADES, vocabulary mapping, and more.

Package Statuses (as of 09Sep2024)

HADES Maintainers

Package	Version	Maintainer(s)	Availability
Achilles	v1.7.2	Frank DeFalco	CRAN
Antramedia	v0.8.7	Martijn Schuemie	CRAN
BigData	v1.0.2	Martijn Schuemie	GitHub
BioRxnAdaptiveRidge	v1.0.7	Marc Suchard	CRAN
SAGE	v2.0.3	Martin Lavallee	GitHub
Characterization	v2.0.1	Jenna Repts	GitHub
CircBF	v1.3.7	Chris Knell	CRAN
ConoRTUareosites	v3.2.3	Jamie Gilbert	GitHub
ConoRTExplorer	v0.1.0	Gowtham Rao	CRAN
EchertGenerator	v0.11.0	Anthony Sena	GitHub
ConoRTInference	v4.0.7	Chris Knell	GitHub
ConoRTMethod	v4.3.0	Martijn Schuemie	GitHub
Cytbase	v2.4.1	Marc Suchard	CRAN
DatabaseConnector	v5.7.3	Martijn Schuemie	CRAN
DataQualityDashboard	v2.6.1	Raby Sadowski	GitHub
DosePatientLevelPrediction	v2.1.0	Egill Fridgeirsson	GitHub
EmpiricalCalibration	v1.1.3	Martijn Schuemie	CRAN
EnsemblePatientLevelPrediction	v1.0.1	Jenna Repts	GitHub
Euzonia	v2.0.0	Frank DeFalco	CRAN
EvidenceSynthesis	v0.7.7	Martijn Schuemie	CRAN
FeatureExtraction	v3.7.0	Ger Inberg	CRAN
Hydra	v0.4.0	Anthony Sena	GitHub
IterativeHardThresholding	v1.0.2	Marc Suchard	CRAN
Keeper	v0.2.8	Anna Ostroplets	GitHub
MethodEvaluation	v2.3.8	Martijn Schuemie	GitHub
OHDSISharing	v0.2.2	Lee Evans	GitHub
OHDSIShinyModules	v3.0.0	Jenna Repts	GitHub
ParallelLogger	v3.3.1	Martijn Schuemie	CRAN
PatientLevelPrediction	v6.3.9	Egill Fridgeirsson & Jenna Repts	GitHub
PhenotypeLibrary	v3.32.0	Gowtham Rao	GitHub
Phevaluator	v2.2.11	Joel Swerdel	GitHub
ResultModelManager	v0.5.10	Jamie Gilbert	GitHub
ROHDSIWebApp	v1.3.3	Gowtham Rao	GitHub
SelfControlledCaseSeries	v5.3.8	Martijn Schuemie	GitHub
SelfControlledCohort	v1.6.0	Jamie Gilbert	GitHub
ShinyAppBuilder	v3.0.0	Jenna Repts	GitHub
SqlBender	v1.18.1	Martijn Schuemie	CRAN

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!



Adam Black



Frank DeFalco



Lee Evans



Egill Fridgeirsson



Jamie Gilbert



Ger Inberg



Christopher Knoll



Martin Lavallee



Anna Ostroplets



Gowtham Rao



Jenna Repts



Peter Rijnbeek



Katy Sadowski



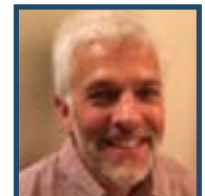
Martijn Schuemie



Anthony Sena



Marc Suchard

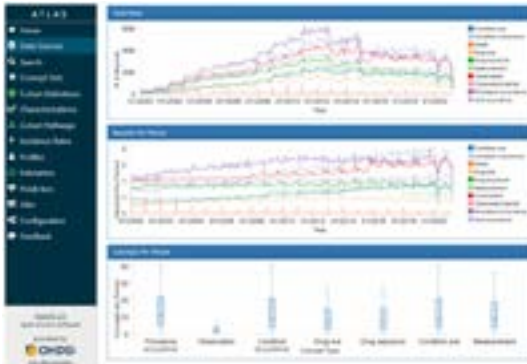


Joel Swerdel

ATLAS

ATLAS is a free, publicly available, web-based tool developed by the OHDSI community that facilitates the design and execution of analyses on standardized, patient-level, observational data in the OMOP CDM format.

Enabling A Journey From Data To Evidence



Explore Data



Design Analyses



Produce Code

Generate Evidence

This section contains three screenshots illustrating the 'Generate Evidence' process. The top screenshot shows a heatmap visualization of data. The middle screenshot displays a network diagram with nodes and connecting lines, alongside a bar chart. The bottom screenshot shows a scatter plot with data points and a regression line, along with a table of results.



“ATLAS makes it possible for everyone in the OHDSI community to collaboratively design high-quality observational studies and produce reproducible code that can be shared and executed on OMOP CDM databases around the world.”

- Christopher Knoll
2018 Titan Award for Open-Source Development recipient

Want to learn more about ATLAS?

Experience: atlas-demo.ohdsi.org

Download: github.com/ohdsi/atlas

Read: book.ohdsi.org

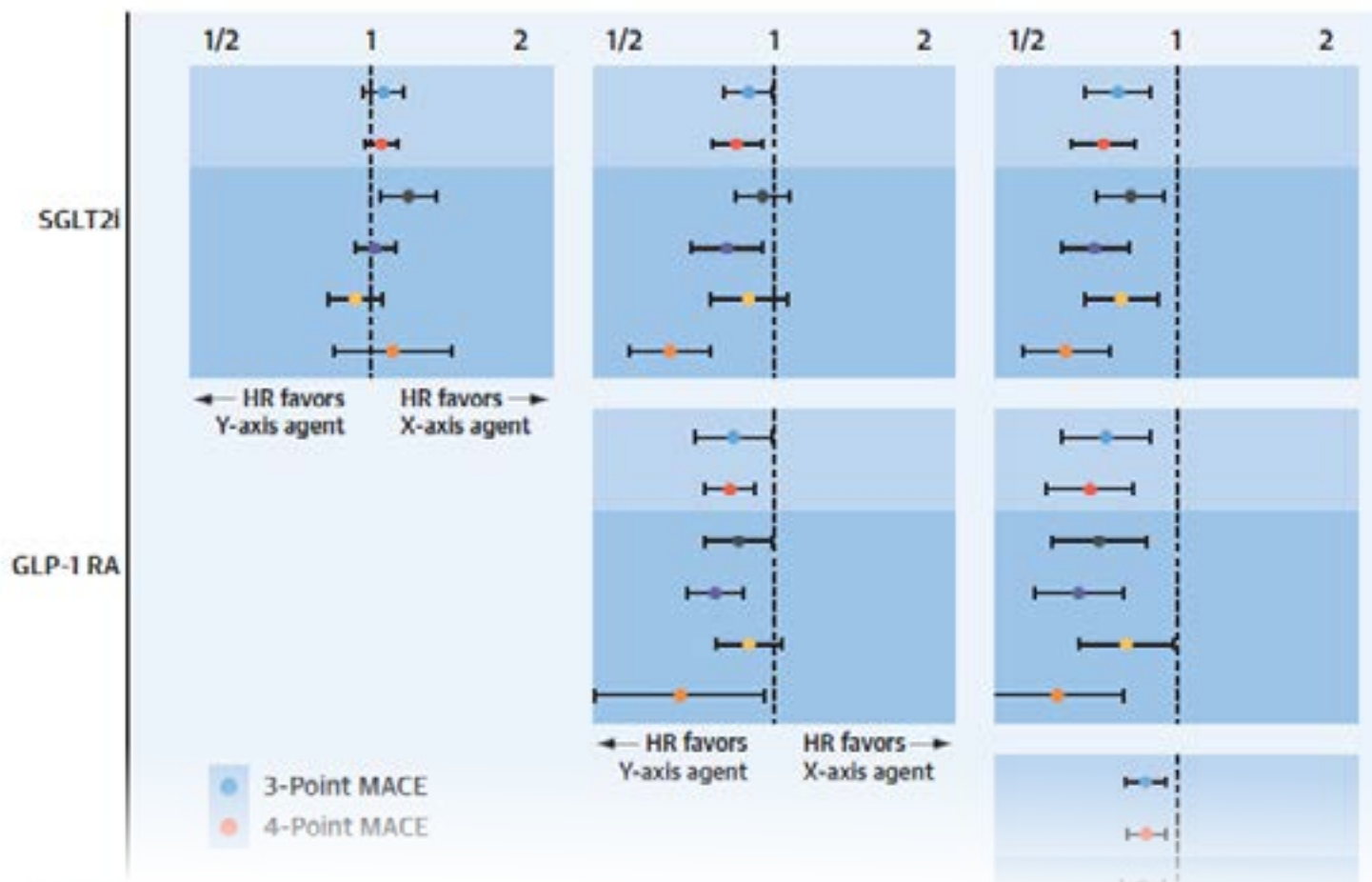
Train: academy.ehden.eu





VIII.

Methods Research



LEGEND in Principle

LEGEND (Large-scale Evidence Generation and Evaluation across a Network of Databases) applies high-level analytics to perform observational research on hundreds of millions of patient records within OHDSI's international database network.

LEGEND is based on 10 guiding principles that were published in JAMIA (August, 2020) and are listed below.

1. LEGEND will generate evidence at a large scale. Instead of answering a single question at a time (eg, the effect of 1 treatment on 1 outcome), LEGEND answers large sets of related questions at once (eg, the effects of many treatments for a disease on many outcomes). **Aim:** Avoids publication bias, achieves comprehensiveness of results, and allows for an evaluation of the overall coherence and consistency of the generated evidence.

2. Dissemination of the evidence will not depend on the estimated effects. All generated evidence is disseminated at once. **Aim:** Avoids publication bias and enhances transparency.

3. LEGEND will generate evidence using a prespecified analysis design. All analyses, including the research questions that will be answered, will be decided prior to analysis execution. **Aim:** Avoids P hacking.

4. LEGEND will generate evidence by consistently applying a systematic process across all research questions. This principle precludes modification of analyses to obtain a desired answer to any specific question. This does not imply a simple one-size-fits-all process, rather that the logic for modifying an analysis for specific research questions should be explicated and applied systematically. **Aim:** Avoids P hacking and allows for the evaluation of the operating characteristics of this process (Principle 6).

5. LEGEND will generate evidence using best practices. LEGEND answers each question using current best practices, including advanced methods to address confounding, such as propensity scores. Specifically, we will not employ suboptimal methods (in terms of bias) to achieve better computational efficiency. **Aim:** Minimizes bias.

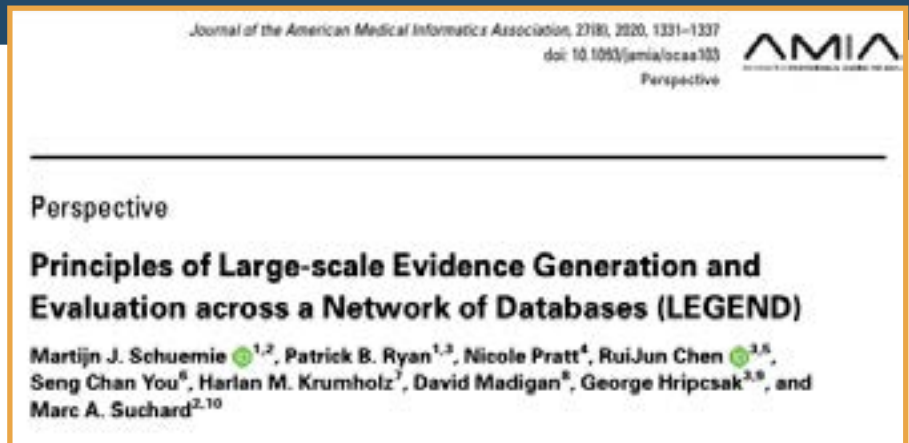
6. LEGEND will include empirical evaluation through the use of control questions. Every LEGEND study includes control questions. Control questions are questions where the answer is known. These allow for measuring the operating characteristics of our systematic process, including residual bias. We subsequently account for this observed residual bias in our P values, effect estimates, and confidence intervals using empirical calibration. [7,8] **Aim:** Enhances transparency on the uncertainty due to residual bias.

7. LEGEND will generate evidence using open-source software that is freely available to all. The analysis software is open to review and evaluation, and is available for replicating analyses down to the smallest detail. **Aim:** Enhances transparency and allows replication.

8. LEGEND will not be used to evaluate new methods. Even though the same infrastructure used in LEGEND may also be used to evaluate new causal inference methods, generating clinical evidence should not be performed at the same time as method evaluation. This is a corollary of Principle 5, since a new method that still requires evaluation cannot already be best practice. Also, generating evidence with unproven methods can hamper the interpretability of the clinical results. Note that LEGEND does evaluate how well the methods it uses perform in the specific context of the questions and data used in a LEGEND study (Principle 6). **Aim:** Avoids bias and improves interpretability.

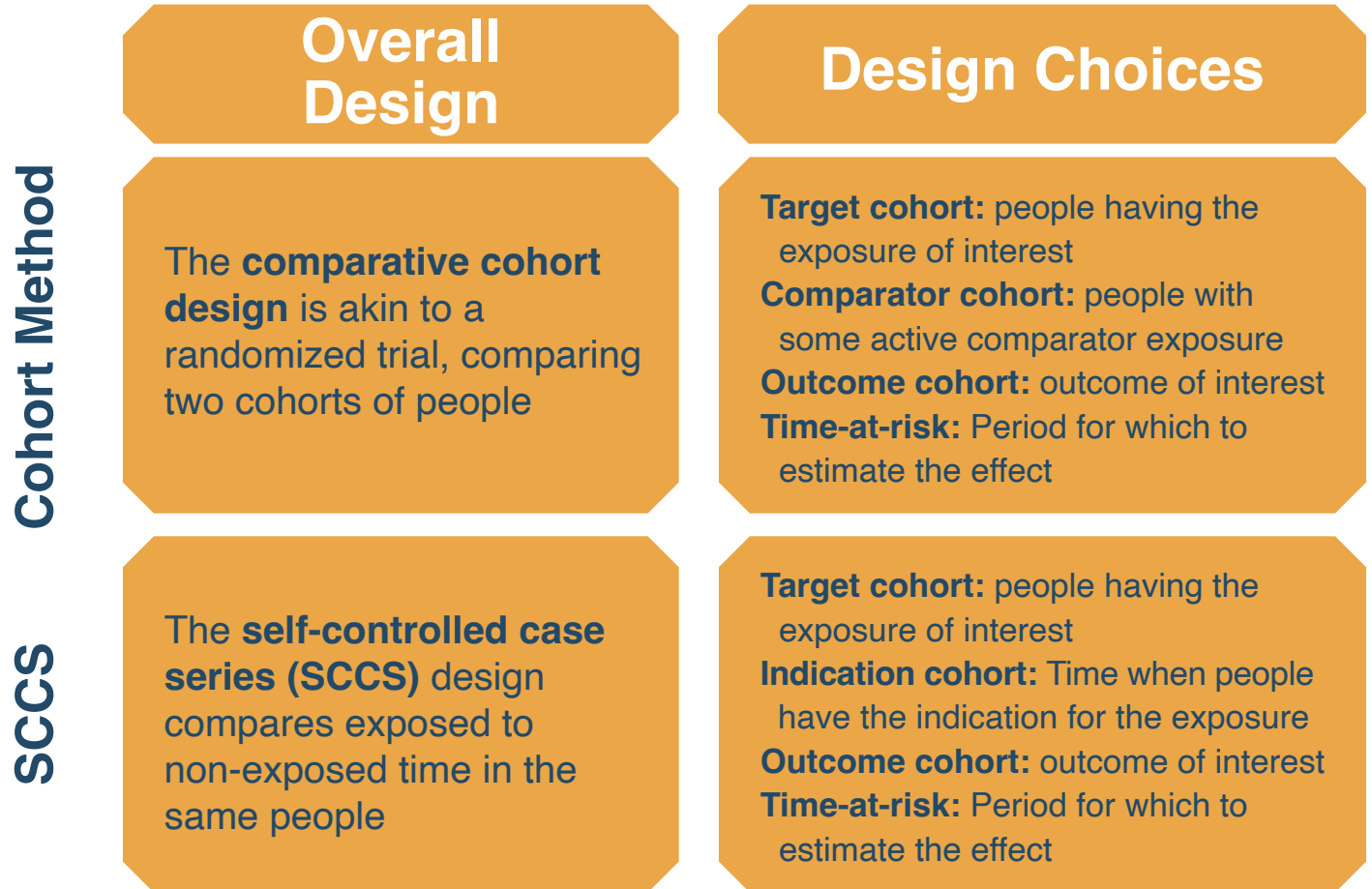
9. LEGEND will generate evidence across a network of multiple databases. Multiple heterogeneous databases (different data capture processes, health-care systems, and populations) will be used to generate the evidence to allow an assessment of the replicability of findings across sites. **Aim:** Enhances generalizability and uncovers potential between-site heterogeneity.

10. LEGEND will maintain data confidentiality; patient-level data will not be shared between sites in the network. Not sharing data will ensure patient privacy, and comply with local data governance rules. **Aim:** Privacy.



The Journey To Reliable Evidence

OHDSI has created a framework for reliably estimating causal effects from real-world data. The two workhorses of this framework are the comparative cohort design and self-controlled case series (SCCS), two designs implemented as open-source R packages. Each design has standardized inputs and outputs, improving reproducibility.

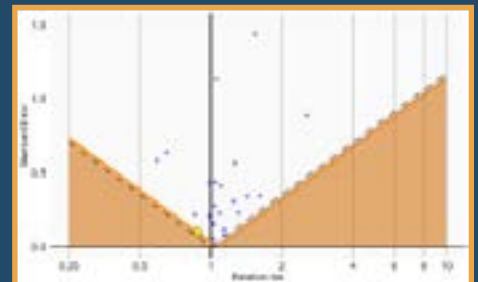


Negative Controls & Empirical Calibration

Negative controls – exposure-outcome pairs with no causal relationship – offer a powerful diagnostic to evaluate the reliability of a population-level effect estimation study. By applying the same method on the same data to a large collection of negative controls, one can determine if there is systematic error in the analysis, whether due to selection bias, confounding, or measurement error.

Negative controls therefore serve as an objective diagnostic applicable to multiple designs: if the expected systematic error exceeds some pre-defined threshold, we should not trust the results of our study.

Empirical calibration is a statistical procedure developed by OHDSI collaborators to use the error distribution estimated from negative controls and correct the original study statistics – point estimates, confidence intervals, and p-values – to restore their nominal operating characteristics and allow for a more honest interpretation of what really has been learned from observational data.

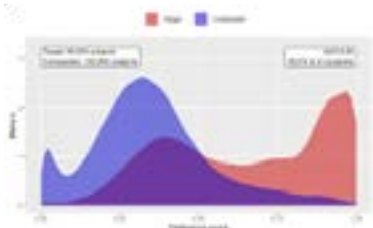


With Causal Effect Estimation

Causal estimates from real-world data are only valid if several assumptions have been met. OHDSI provides advanced methods to adjust for bias (for example due to confounding), and a framework of objective diagnostics verifying the assumptions have been met. A study that fails diagnostics should not have its results unblinded.

Advanced Bias Adjustment

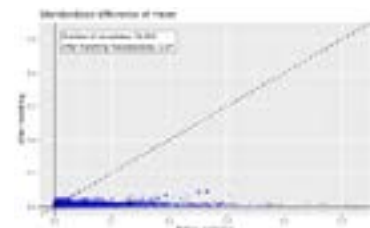
Large-scale propensity scores



A data-driven approach to confounder adjustment

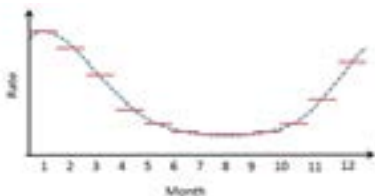
Objective Diagnostics

Covariate balance



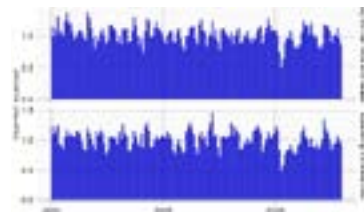
Must achieve balance on all observed variables (often >10,000)

Splines for temporal trends



Flexible and powerful adjustment for time-varying confounding

Temporal stability



Rate of outcome after spline adjustment must be constant over time

Evidence Synthesis

One strength of OHDSI is in its numbers: data from across the OHDSI network can contribute to our understanding of the effects of treatments. A challenge is that only summary statistics, not patient-level data, can be shared. Previously, sites produced effect estimates and confidence intervals, combined via standard meta-analysis. However, this method can be biased when outcomes are rare. OHDSI developed a new approach where sites share likelihood curve shapes as points, which avoids this bias while preserving privacy. This method, now the default in HADES, is used in all OHDSI studies as it performs as well or better than standard meta-analysis.



“The existing observational studies in the literature suffer from biases such as confounding, publication bias, and p-hacking. OHDSI has tackled these challenges by standardizing analytic methods, offering advanced methods for bias correction, and implementing objective diagnostics. These measures enable the generation of reliable evidence for patients and clinical decision-makers.”

- Martijn Schuemie, 2018 Titan Award recipient for Methodological Research

The Journey To Reliable Evidence

Standardized Framework

requires
OMOP CDM



Clear specification of the prediction task

- Target Population: patients at risk
- Outcome: medical event to predict
- Time-at-risk (TAR): interval to predict whether outcome will occur



Deep Learning



Large-scale study investigating model development and validation across the OHDSI network using benchmark tasks.



Open-source software



“Patient-level prediction can make a huge impact on the way we deliver medicine, but a lot more work is needed to ensure quality models are developed. OHDSI is leading research to establish best practices, answering important questions that will ensure future predictive models generate reliable evidence.”

- Jenna Reps

2019 Titan Award recipient for Methodological Research

With Patient-Level Prediction

Best Practices



We are performing large-scale empirical studies that guide model design choices.

Clinical Applications



We are using our expertise to develop clinical models.

Benchmark Tasks



We are defining an expanded set of diverse benchmark tasks.

Open Source



We provide software to efficiently develop and validate models.

Join The PLP Journey

Join the monthly PatientLevelPrediction workgroup call:
2nd Wednesday of each month @ 9am ET/3pm CET

PLP GitHub: github.com/OHDSI/PatientLevelPrediction



“In order for Patient-Level Prediction modelling to truly have patient-level impact, we need to answer the questions that matter to clinicians. To do this we must provide clear guidance on how to develop safe and effective models. The PLP workgroup researches best practices and provides training to empower members to create impactful models.”

- Ross Williams

2021 Titan Award recipient for Community Support

Generative AI & Foundational Models

Generative AI brings exciting new possibilities that we are still learning to leverage. The **Generative AI & Foundational Models Workgroup** brings together a diverse set of researchers working towards safe and responsible use of generative AI in observational research.

We're currently exploring two types of generative models:

- Large Language Models (LLMs)
- Foundational Models for Electronic Records (FMEHR)

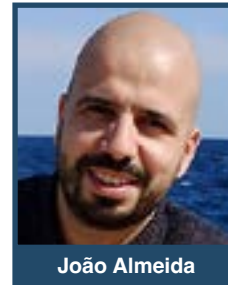
Large Language Models (LLMs)

LLMs are pretrained on predicting the next word in a large text corpus.



To do this task well, an LLM must not only learn syntax (spelling, grammar), but also semantics.

LLMs are often finetuned for tasks such as chat. Well-known LLMs are ChatGPT, Gemini, and Llama.



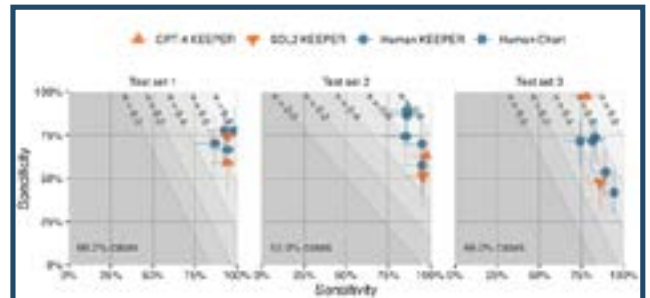
João Almeida



Martijn Schuemie

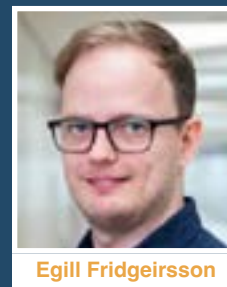
OHDSI is exploring various use cases for LLMs in observational research:

- Automated case adjudication (possibly replacing chart review)
- A copilot for (network) study design
- Automatic vocabulary mapping
- A copilot for exploring evidence generated by OHDSI
- Synthesizing real-world evidence with other sources of evidence (i.e. writing the Background and Discussion sections of a paper)

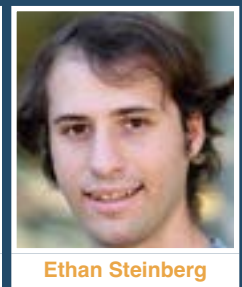


Foundational Models for Electronic Records (FMEHR)

FMEHRs are pretrained on predicting the next event in a patient's record. This pretraining uses all events of all patients in a database. The resulting model is not a language model, but uses many of the same technologies as LLMs such as transformers. FMEHRs can be finetuned for tasks such as predicting specific outcomes but can also fit other use cases.



Egill Fridgeirsson



Ethan Steinberg

OHDSI is exploring the following use cases for FMEHRs:

- Improved patient-level prediction
- Counterfactual prediction (also referred to as 'digital twins' or 'cloning')
- Simulating large datasets for software development and methods research
- Automated phenotyping

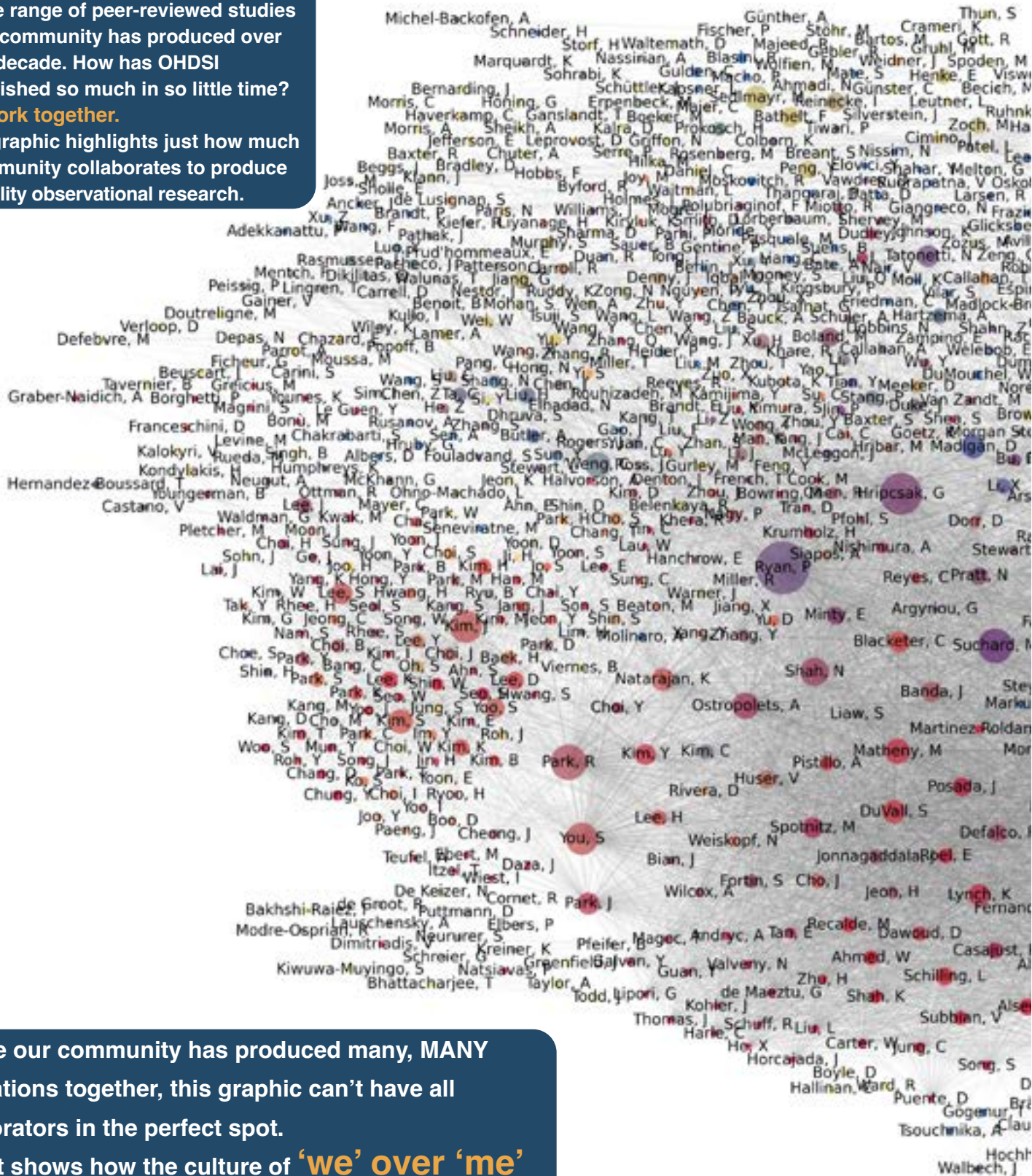


Collaborations Within

In this section, you will see the depth and wide range of peer-reviewed studies that our community has produced over the last decade. How has OHDSI accomplished so much in so little time?

We work together.

This graphic highlights just how much our community collaborates to produce high-quality observational research.



Since our community has produced many, MANY publications together, this graphic can't have all collaborators in the perfect spot.

But it shows how the culture of **'we' over 'me'** has powered OHDSI to incredible heights.

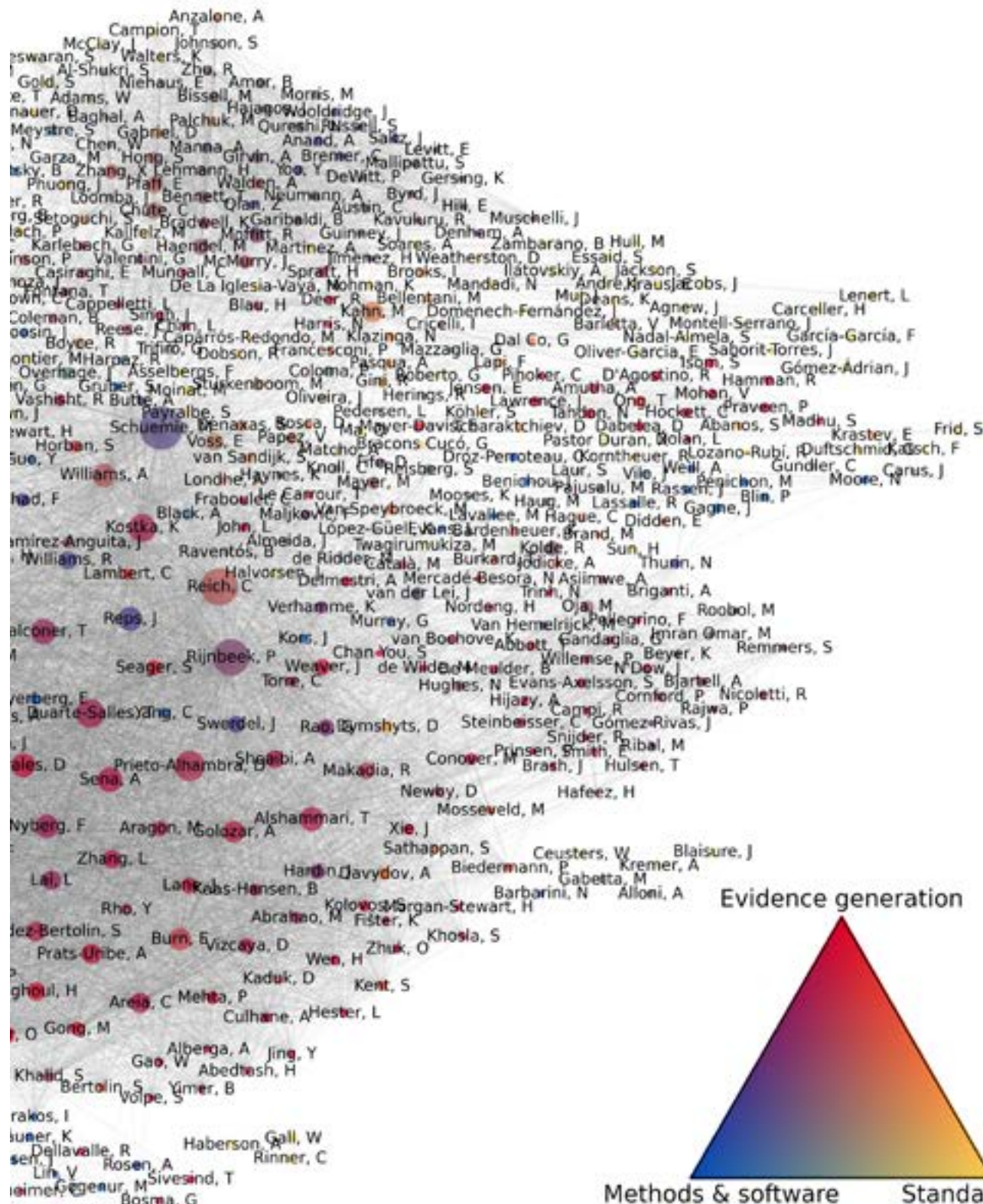
Our OHDSI Community

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

- Each dot is an OHDSI collaborator with at least 2 OHDSI papers, which include studies involving OMOP
- Size of the dot indicates the number of OHDSI/OMOP papers
- The color indicates the mix of topics that an author has published on (see legend below)
- A line means two authors were on the same paper. The darker the color of the line, the more papers they co-authored
- The layout is based on co-authorships, so people who collaborated more end up close together in the graph

LEGEND

- Methods & software: Blue
 Standards: Yellow
 Clinical evidence: Red



OHDSI PUBLICATIONS

1. Stang PE, Ryan PB, Racoosin JA, Overhage JM, Hartzema AG, Reich C, Welebob E, Scarnecchia T, Woodcock J. Advancing the science for active surveillance: rationale and design for the Observational Medical Outcomes Partnership. *Ann Intern Med.* 2010;153(9):600-6. doi: 10.7326/0003-4819-153-9-201011020-00010. PubMed PMID: 21041580.
2. Schuemie MJ. Methods for drug safety signal detection in longitudinal observational databases: LGPS and LEOPARD. *Pharmacoepidemiol Drug Saf.* 2011;20(3):292-9. Epub 20101013. doi: 10.1002/pds.2051. PubMed PMID: 20945505.
3. Madigan D, Ryan P. What can we really learn from observational studies?: the need for empirical assessment of methodology for active drug safety surveillance and comparative effectiveness research. *Epidemiology.* 2011;22(5):629-31. doi: 10.1097/EDE.0b013e318228ca1d. PubMed PMID: 21811110.
4. Overhage JM, Ryan PB, Reich CG, Hartzema AG, Stang PE. Validation of a common data model for active safety surveillance research. *J Am Med Inform Assoc.* 2012;19(1):54-60. Epub 20111028. doi: 10.1136/amiainl-2011-000376. PubMed PMID: 22037893; PubMed Central PMCID: PMC3240764.
5. Carnahan RM, Moores KG. Mini-Sentinel's systematic reviews of validated methods for identifying health outcomes using administrative and claims data: methods and lessons learned. *Pharmacoepidemiol Drug Saf.* 2012;21 Suppl 1:82-9. doi: 10.1002/pds.2321. PubMed PMID: 22262596.
6. Reich C, Ryan PB, Stang PE, Rocca M. Evaluation of alternative standardized terminologies for medical conditions within a network of observational healthcare databases. *J Biomed Inform.* 2012;45(4):689-96. Epub 20120607. doi: 10.1016/j.jbi.2012.05.002. PubMed PMID: 22683994.
7. Kahn MG, Raebel MA, Glanz JM, Riedlinger K, Steiner JF. A pragmatic framework for single-site and multisite data quality assessment in electronic health record-based clinical research. *Med Care.* 2012;50 Suppl(0):S21-9. doi: 10.1097/MLR.0b013e318257dd67. PubMed PMID: 22692254; PubMed Central PMCID: PMC3833692.
8. Schuemie MJ, Coloma PM, Straatman H, Herings RM, Trifirò G, Matthews JN, Prieto-Merino D, Molokhia M, Pedersen L, Gini R, Innocenti F, Mazzaglia G, Picelli G, Scotti L, van der Lei J, Sturkenboom MC. Using electronic health care records for drug safety signal detection: a comparative evaluation of statistical methods. *Med Care.* 2012;50(10):890-7. doi: 10.1097/MLR.0b013e31825f63bf. PubMed PMID: 22929992.
9. Ryan PB, Madigan D, Stang PE, Overhage JM, Racoosin JA, Hartzema AG. Empirical assessment of methods for risk identification in healthcare data: results from the experiments of the Observational Medical Outcomes Partnership. *Stat Med.* 2012;31(30):4401-15. Epub 20120927. doi: 10.1002/sim.5620. PubMed PMID: 23015364.
10. Zorych I, Madigan D, Ryan P, Bate A. Disproportionality methods for pharmacovigilance in longitudinal observational databases. *Stat Methods Med Res.* 2013;22(1):39-56. Epub 20110830. doi: 10.1177/0962280211403602. PubMed PMID: 21878461.
11. Zhou X, Murugesan S, Bhullar H, Liu Q, Cai B, Wentworth C, Bate A. An evaluation of the THIN database in the OMOP Common Data Model for active drug safety surveillance. *Drug Saf.* 2013;36(2):119-34. doi: 10.1007/s40264-012-0009-3. PubMed PMID: 23329543.
12. Defalco FJ, Ryan PB, Soledad Cepeda M. Applying standardized drug terminologies to observational healthcare databases: a case study on opioid exposure. *Health Serv Outcomes Res Methodol.* 2013;13(1):58-67. Epub 20121027. doi: 10.1007/s10742-012-0102-1. PubMed PMID: 23396660; PubMed Central PMCID: PMC3566397.
13. Li X, Hui S, Ryan P, Rosenman M, Overhage M. Statistical visualization for assessing performance of methods for safety surveillance using electronic databases. *Pharmacoepidemiol Drug Saf.* 2013;22(5):503-9. Epub 20130214. doi: 10.1002/pds.3419. PubMed PMID: 23408560.
14. Harpaz R, DuMouchel W, LePendu P, Bauer-Mehren A, Ryan P, Shah NH. Performance of pharmacovigilance signal-detection algorithms for the FDA adverse event reporting system. *Clin Pharmacol Ther.* 2013;93(6):539-46. Epub 20130211. doi: 10.1038/clpt.2013.24. PubMed PMID: 23571771; PubMed Central PMCID: PMC3857139.
15. Madigan D, Ryan PB, Schuemie M, Stang PE, Overhage JM, Hartzema AG, Suchard MA, DuMouchel W, Berlin JA. Evaluating the impact of database heterogeneity on observational study results. *Am J Epidemiol.* 2013;178(4):645-51. Epub 20130505. doi: 10.1093/aje/kwt010. PubMed PMID: 23648805; PubMed Central PMCID: PMC3736754.
16. Katz AJ, Ryan PB, Racoosin JA, Stang PE. Assessment of case definitions for identifying acute liver injury in large observational databases. *Drug Saf.* 2013;36(8):651-61. doi: 10.1007/s40264-013-0060-8. PubMed PMID: 23670723.
17. Ogunyemi OI, Meeker D, Kim HE, Ashish N, Farzaneh S, Boxwala A. Identifying appropriate reference data models for comparative effectiveness research (CER) studies based on data from clinical information systems. *Med Care.* 2013;51(8 Suppl 3):S45-52. doi: 10.1097/MLR.0b013e31829b1e0b. PubMed PMID: 23774519.
18. Simpson SE, Madigan D, Zorych I, Schuemie MJ, Ryan PB, Suchard MA. Multiple self-controlled case series for large-scale longitudinal observational databases. *Biometrics.* 2013;69(4):893-902. Epub 20131011. doi: 10.1111/biom.12078. PubMed PMID: 24117144.
19. Stang PE, Ryan PB, Overhage JM, Schuemie MJ, Hartzema AG, Welebob E. Variation in choice of study design: findings from the Epidemiology Design Decision Inventory and Evaluation (EDDIE) survey. *Drug Saf.* 2013;36 Suppl 1:S15-25. doi: 10.1007/s40264-013-0103-1. PubMed PMID: 24166220.
20. Ryan PB, Schuemie MJ, Welebob E, Duke J, Valentine S, Hartzema AG. Defining a reference set to support methodological research in drug safety. *Drug Saf.* 2013;36 Suppl 1:S33-47. doi: 10.1007/s40264-013-0097-8. PubMed PMID: 24166222.
21. Hartzema AG, Reich CG, Ryan PB, Stang PE, Madigan D, Welebob E, Overhage JM. Managing data quality for a drug safety surveillance system. *Drug Saf.* 2013;36 Suppl 1:S49-58. doi: 10.1007/s40264-013-0098-7. PubMed PMID: 24166223.
22. Ryan PB, Schuemie MJ, Gruber S, Zorych I, Madigan D. Empirical performance of a new user cohort method: lessons for developing a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S59-72. doi: 10.1007/s40264-013-0099-6. PubMed PMID: 24166224.
23. Madigan D, Schuemie MJ, Ryan PB. Empirical performance of the case-control method: lessons for developing a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S73-82. doi: 10.1007/s40264-013-0105-z. PubMed PMID: 24166225.
24. Suchard MA, Zorych I, Simpson SE, Schuemie MJ, Ryan PB, Madigan D. Empirical performance of the self-controlled case series design: lessons for developing a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S83-93. doi: 10.1007/s40264-013-0100-4. PubMed PMID: 24166226.
25. Ryan PB, Schuemie MJ, Madigan D. Empirical performance of a self-controlled cohort method: lessons for developing a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S95-106. doi: 10.1007/s40264-013-0101-3. PubMed PMID: 24166227.
26. Norén GN, Bergvall T, Ryan PB, Juhlin K, Schuemie MJ, Madigan D. Empirical performance of the calibrated self-controlled cohort analysis within temporal pattern discovery: lessons for developing a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S107-21. doi: 10.1007/s40264-013-0095-x. PubMed PMID: 24166228.
27. DuMouchel W, Ryan PB, Schuemie MJ, Madigan D. Evaluation of disproportionality safety signaling applied to healthcare databases. *Drug Saf.* 2013;36 Suppl 1:S123-32. doi: 10.1007/s40264-013-0106-y. PubMed PMID: 24166229.
28. Schuemie MJ, Madigan D, Ryan PB. Empirical performance of LGPS and LEOPARD: lessons for developing a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S133-42. doi: 10.1007/s40264-013-0107-x. PubMed PMID: 24166230.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

29. Ryan PB, Stang PE, Overhage JM, Suchard MA, Hartzema AG, DuMouchel W, Reich CG, Schuemie MJ, Madigan D. A comparison of the empirical performance of methods for a risk identification system. *Drug Saf.* 2013;36 Suppl 1:S143-58. doi: 10.1007/s40264-013-0108-9. PubMed PMID: 24166231.
30. Schuemie MJ, Gini R, Coloma PM, Straatman H, Herings RM, Pedersen L, Innocenti F, Mazzaglia G, Picelli G, van der Lei J, Sturkenboom MC. Replication of the OMOP experiment in Europe: evaluating methods for risk identification in electronic health record databases. *Drug Saf.* 2013;36 Suppl 1:S159-69. doi: 10.1007/s40264-013-0109-8. PubMed PMID: 24166232.
31. Ryan PB, Schuemie MJ. Evaluating performance of risk identification methods through a large-scale simulation of observational data. *Drug Saf.* 2013;36 Suppl 1:S171-80. doi: 10.1007/s40264-013-0110-2. PubMed PMID: 24166233.
32. Reich CG, Ryan PB, Schuemie MJ. Alternative outcome definitions and their effect on the performance of methods for observational outcome studies. *Drug Saf.* 2013;36 Suppl 1:S181-93. doi: 10.1007/s40264-013-0111-1. PubMed PMID: 24166234.
33. Reich CG, Ryan PB, Suchard MA. The impact of drug and outcome prevalence on the feasibility and performance of analytical methods for a risk identification and analysis system. *Drug Saf.* 2013;36 Suppl 1:S195-204. doi: 10.1007/s40264-013-0112-0. PubMed PMID: 24166235.
34. Lian Duan L, Khoshneshin M, Street WN, Liu M. Adverse drug effect detection. *IEEE J Biomed Health Inform.* 2013;17(2):305-11. doi: 10.1109/titb.2012.2227272. PubMed PMID: 24235108.
35. Ryan PB, Madigan D, Stang PE, Schuemie MJ, Hripcsak G. Medication-wide association studies. *CPT Pharmacometrics Syst Pharmacol.* 2013;2(9):e76. Epub 20130918. doi: 10.1038/psp.2013.52. PubMed PMID: 24448022; PubMed Central PMCID: PMC4026636.
36. Huser V, Cimino JJ. Desiderata for healthcare integrated data repositories based on architectural comparison of three public repositories. *AMIA Annu Symp Proc.* 2013;2013:648-56. Epub 20131116. PubMed PMID: 24551366; PubMed Central PMCID: PMC3900207.
37. Madigan D, Ryan PB, Schuemie M. Does design matter? Systematic evaluation of the impact of analytical choices on effect estimates in observational studies. *Ther Adv Drug Saf.* 2013;4(2):53-62. doi: 10.1177/2042098613477445. PubMed PMID: 25083251; PubMed Central PMCID: PMC4110833.
38. Suchard MA, Simpson SE, Zorych I, Ryan P, Madigan D. Massive parallelization of serial inference algorithms for a complex generalized linear model. *ACM Trans Model Comput Simul.* 2013;23(1). doi: 10.1145/2414416.2414791. PubMed PMID: 25328363; PubMed Central PMCID: PMC4201181.
39. Schuemie MJ, Ryan PB, DuMouchel W, Suchard MA, Madigan D. Interpreting observational studies: why empirical calibration is needed to correct p-values. *Stat Med.* 2014;33(2):209-18. Epub 20130730. doi: 10.1002/sim.5925. PubMed PMID: 23900808; PubMed Central PMCID: PMC4285234.
40. Schuemie MJ, Ryan PB, Suchard MA, Shahn Z, Madigan D. Discussion: An estimate of the science-wise false discovery rate and application to the top medical literature. *Biostatistics.* 2014;15(1):36-9; discussion 9-45. Epub 20130925. doi: 10.1093/biostatistics/kxt037. PubMed PMID: 24068252; PubMed Central PMCID: PMC3862211.
41. Fife D, Zhu V, Voss E, Levy-Clarke G, Ryan P. Exposure to oral fluoroquinolones and the risk of retinal detachment: retrospective analyses of two large healthcare databases. *Drug Saf.* 2014;37(3):171-82. doi: 10.1007/s40264-014-0138-y. PubMed PMID: 24526267; PubMed Central PMCID: PMC3936132.
42. Trifirò G, Coloma PM, Rijnbeek PR, Romio S, Mosseveld B, Weibel D, Bonhoeffer J, Schuemie M, van der Lei J, Sturkenboom M. Combining multiple healthcare databases for postmarketing drug and vaccine safety surveillance: why and how? *J Intern Med.* 2014;275(6):551-61. doi: 10.1111/joim.12159. PubMed PMID: 24635221.
43. White RW, Harpaz R, Shah NH, DuMouchel W, Horvitz E. Toward enhanced pharmacovigilance using patient-generated data on the internet. *Clin Pharmacol Ther.* 2014;96(2):239-46. Epub 20140408. doi: 10.1038/clpt.2014.77. PubMed PMID: 24713590; PubMed Central PMCID: PMC4111778.
44. Ohno-Machado L, Agha Z, Bell DS, Dahm L, Day ME, Doctor JN, Gabriel D, Kahlon MK, Kim KK, Hogarth M, Matheny ME, Meeker D, Nebeker JR. pSCANNER: patient-centered Scalable National Network for Effectiveness Research. *J Am Med Inform Assoc.* 2014;21(4):621-6. Epub 20140429. doi: 10.1136/amiainjnl-2014-002751. PubMed PMID: 24780722; PubMed Central PMCID: PMC4078293.
45. Forrest CB, Margolis PA, Bailey LC, Marsolo K, Del Beccaro MA, Finkelstein JA, Milov DE, Vieland VJ, Wolf BA, Yu FB, Kahn MG. PEDSnet: a National Pediatric Learning Health System. *J Am Med Inform Assoc.* 2014;21(4):602-6. Epub 20140512. doi: 10.1136/amiainjnl-2014-002743. PubMed PMID: 24821737; PubMed Central PMCID: PMC4078288.
46. Boyce RD, Ryan PB, Norén GN, Schuemie MJ, Reich C, Duke J, Tatonetti NP, Trifirò G, Harpaz R, Overhage JM, Hartzema AG, Khayter M, Voss EA, Lambert CG, Huser V, Dumontier M. Bridging islands of information to establish an integrated knowledge base of drugs and health outcomes of interest. *Drug Saf.* 2014;37(8):557-67. doi: 10.1007/s40264-014-0189-0. PubMed PMID: 24985530; PubMed Central PMCID: PMC4134480.
47. Matcho A, Ryan P, Fife D, Reich C. Fidelity assessment of a clinical practice research datalink conversion to the OMOP common data model. *Drug Saf.* 2014;37(11):945-59. doi: 10.1007/s40264-014-0214-3. PubMed PMID: 25187016; PubMed Central PMCID: PMC4206771.
48. Rijnbeek PR. Converting to a common data model: what is lost in translation? : Commentary on "fidelity assessment of a clinical practice research datalink conversion to the OMOP common data model". *Drug Saf.* 2014;37(11):893-6. doi: 10.1007/s40264-014-0221-4. PubMed PMID: 25187018.
49. Vilar S, Ryan PB, Madigan D, Stang PE, Schuemie MJ, Friedman C, Tatonetti NP, Hripcsak G. Similarity-based modeling applied to signal detection in pharmacovigilance. *CPT Pharmacometrics Syst Pharmacol.* 2014;3(9):e137. Epub 20140924. doi: 10.1038/psp.2014.35. PubMed PMID: 25250527; PubMed Central PMCID: PMC4211266.
50. Makadia R, Ryan PB. Transforming the Premier Perspective Hospital Database into the Observational Medical Outcomes Partnership (OMOP) Common Data Model. *EGEMS (Wash DC).* 2014;2(1):1110. Epub 20141111. doi: 10.13063/2327-9214.1110. PubMed PMID: 25848597; PubMed Central PMCID: PMC4371500.
51. Pace WD, Fox CH, White T, Graham D, Schilling LM, West DR. The DARTNet Institute: Seeking a Sustainable Support Mechanism for Electronic Data Enabled Research Networks. *EGEMS (Wash DC).* 2014;2(2):1063. Epub 20140902. doi: 10.13063/2327-9214.1063. PubMed PMID: 25848603; PubMed Central PMCID: PMC4371434.
52. Hansen RA, Zeng P, Ryan P, Gao J, Sonawane K, Teeter B, Westrich K, Dubois RW. Exploration of heterogeneity in distributed research network drug safety analyses. *Res Synth Methods.* 2014;5(4):352-70. Epub 20140526. doi: 10.1002/jrsm.1121. PubMed PMID: 26052957.
53. Voss EA, Makadia R, Matcho A, Ma Q, Knoll C, Schuemie M, DeFalco FJ, Londhe A, Zhu V, Ryan PB. Feasibility and utility of applications of the common data model to multiple, disparate observational health databases. *J Am Med Inform Assoc.* 2015;22(3):553-64. Epub 20150210. doi: 10.1093/jamia/ocu023. PubMed PMID: 25670757; PubMed Central PMCID: PMC4457111.
54. Voss EA, Ryan PB, Stang PE, Hough D, Alphas L. Switching from risperidone long-acting injectable to paliperidone long-acting injectable or oral antipsychotics: analysis of a Medicaid claims database. *Int Clin Psychopharmacol.* 2015;30(3):151-7. doi: 10.1097/yic.000000000000068. PubMed PMID: 25730525; PubMed Central PMCID: PMC4383368.

<2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	38	46	79	119	124	108	167

55. Boland MR, Tatonetti NP, Hripcsak G. Development and validation of a classification approach for extracting severity automatically from electronic health records. *J Biomed Semantics*. 2015;6:14. Epub 20150406. doi: 10.1186/s13326-015-0010-8. PubMed PMID: 25848530; PubMed Central PMCID: PMC4386082.
56. Voss EA, Ma Q, Ryan PB. The impact of standardizing the definition of visits on the consistency of multi-database observational health research. *BMC Med Res Methodol*. 2015;15:13. Epub 20150308. doi: 10.1186/s12874-015-0001-6. PubMed PMID: 25887092; PubMed Central PMCID: PMC4369827.
57. Kahn MG, Brown JS, Chun AT, Davidson BN, Meeker D, Ryan PB, Schilling LM, Weiskopf NG, Williams AE, Zozus MN. Transparent reporting of data quality in distributed data networks. *EGEMS (Wash DC)*. 2015;3(1):1052. Epub 20150323. doi: 10.13063/2327-9214.1052. PubMed PMID: 25992385; PubMed Central PMCID: PMC4434997.
58. Boland MR, Shahn Z, Madigan D, Hripcsak G, Tatonetti NP. Birth month affects lifetime disease risk: a phenome-wide method. *J Am Med Inform Assoc*. 2015;22(5):1042-53. Epub 20150602. doi: 10.1093/jamia/ocv046. PubMed PMID: 26041386; PubMed Central PMCID: PMC4986668.
59. Xu Y, Zhou X, Suehs BT, Hartzema AG, Kahn MG, Moride Y, Sauer BC, Liu Q, Moll K, Pasquale MK, Nair VP, Bate A. A Comparative Assessment of Observational Medical Outcomes Partnership and Mini-Sentinel Common Data Models and Analytics: Implications for Active Drug Safety Surveillance. *Drug Saf*. 2015;38(8):749-65. doi: 10.1007/s40264-015-0297-5. PubMed PMID: 26055920.
60. Vilar S, Lorberbaum T, Hripcsak G, Tatonetti NP. Improving Detection of Arrhythmia Drug-Drug Interactions in Pharmacovigilance Data through the Implementation of Similarity-Based Modeling. *PLoS One*. 2015;10(6):e0129974. Epub 20150612. doi: 10.1371/journal.pone.0129974. PubMed PMID: 26068584; PubMed Central PMCID: PMC4466327.
61. Garbe E, Pigeot I. [Benefits of large healthcare databases for drug risk research]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*. 2015;58(8):829-37. doi: 10.1007/s00103-015-2185-7. PubMed PMID: 26092163.
62. Reps JM, Garibaldi JM, Aickelin U, Gibson JE, Hubbard RB. A supervised adverse drug reaction signalling framework imitating Bradford Hill's causality considerations. *J Biomed Inform*. 2015;56:356-68. Epub 20150624. doi: 10.1016/j.jbi.2015.06.011. PubMed PMID: 26116429.
63. Li Y, Ryan PB, Wei Y, Friedman C. A Method to Combine Signals from Spontaneous Reporting Systems and Observational Healthcare Data to Detect Adverse Drug Reactions. *Drug Saf*. 2015;38(10):895-908. doi: 10.1007/s40264-015-0314-8. PubMed PMID: 26153397; PubMed Central PMCID: PMC4579260.
64. Hripcsak G, Duke JD, Shah NH, Reich CG, Huser V, Schuemie MJ, Suchard MA, Park RW, Wong IC, Rijnbeek PR, van der Lei J, Pratt N, Norén GN, Li YC, Stang PE, Madigan D, Ryan PB. Observational Health Data Sciences and Informatics (OHDSI): Opportunities for Observational Researchers. *Stud Health Technol Inform*. 2015;216:574-8. PubMed PMID: 26262116; PubMed Central PMCID: PMC4815923.
65. Boland MR, Tatonetti NP. Are All Vaccines Created Equal? Using Electronic Health Records to Discover Vaccines Associated With Clinician-Coded Adverse Events. *AMIA Jt Summits Transl Sci Proc*. 2015;2015:196-200. Epub 20150323. PubMed PMID: 26306268; PubMed Central PMCID: PMC4525221.
66. FitzHenry F, Resnic FS, Robbins SL, Denton J, Nookala L, Meeker D, Ohno-Machado L, Matheny ME. Creating a Common Data Model for Comparative Effectiveness with the Observational Medical Outcomes Partnership. *Appl Clin Inform*. 2015;6(3):536-47. Epub 20150826. doi: 10.4338/aci-2014-12-cr-0121. PubMed PMID: 26448797; PubMed Central PMCID: PMC4586341.
67. Sun H, Depraetere K, De Roo J, Mels G, De Vloed B, Twagirumukiza M, Colaert D. Semantic processing of EHR data for clinical research. *J Biomed Inform*. 2015;58:247-59. Epub 20151026. doi: 10.1016/j.jbi.2015.10.009. PubMed PMID: 26515501.
68. Khalilia M, Choi M, Henderson A, Iyengar S, Braunstein M, Sun J. Clinical Predictive Modeling Development and Deployment through FHIR Web Services. *AMIA Annu Symp Proc*. 2015;2015:717-26. Epub 20151105. PubMed PMID: 26958207; PubMed Central PMCID: PMC4765683.
69. Schuemie MJ, Trifirò G, Coloma PM, Ryan PB, Madigan D. Detecting adverse drug reactions following long-term exposure in longitudinal observational data: The exposure-adjusted self-controlled case series. *Stat Methods Med Res*. 2016;25(6):2577-92. Epub 20140331. doi: 10.1177/0962280214527531. PubMed PMID: 24685766.
70. Yoon D, Schuemie MJ, Kim JH, Kim DK, Park MY, Ahn EK, Jung EY, Park DK, Cho SY, Shin D, Hwang Y, Park RW. A normalization method for combination of laboratory test results from different electronic healthcare databases in a distributed research network. *Pharmacoepidemiol Drug Saf*. 2016;25(3):307-16. Epub 20151103. doi: 10.1002/pds.3893. PubMed PMID: 26527579.
71. Boland MR, Jacunski A, Lorberbaum T, Romano JD, Moskovitch R, Tatonetti NP. Systems biology approaches for identifying adverse drug reactions and elucidating their underlying biological mechanisms. *Wiley Interdiscip Rev Syst Biol Med*. 2016;8(2):104-22. Epub 20151112. doi: 10.1002/wsbm.1323. PubMed PMID: 26559926; PubMed Central PMCID: PMC4760887.
72. Hauben M, Aronson JK, Ferner RE. Evidence of Misclassification of Drug-Event Associations Classified as Gold Standard 'Negative Controls' by the Observational Medical Outcomes Partnership (OMOP). *Drug Saf*. 2016;39(5):421-32. doi: 10.1007/s40264-016-0392-2. PubMed PMID: 26879560.
73. Yoon D, Ahn EK, Park MY, Cho SY, Ryan P, Schuemie MJ, Shin D, Park H, Park RW. Conversion and Data Quality Assessment of Electronic Health Record Data at a Korean Tertiary Teaching Hospital to a Common Data Model for Distributed Network Research. *Health Inform Res*. 2016;22(1):54-8. Epub 20160131. doi: 10.4258/hir.2016.22.1.54. PubMed PMID: 26893951; PubMed Central PMCID: PMC4756059.
74. Gruber S, Tchetgen Tchetgen E. Limitations of empirical calibration of p-values using observational data. *Stat Med*. 2016;35(22):3869-82. Epub 20160310. doi: 10.1002/sim.6936. PubMed PMID: 26970249; PubMed Central PMCID: PMC5012943.
75. Gini R, Schuemie M, Brown J, Ryan P, Vacchi E, Coppola M, Cazzola W, Coloma P, Berni R, Diallo G, Oliveira JL, Avillach P, Trifirò G, Rijnbeek P, Bellentani M, van Der Lei J, Klazinga N, Sturkenboom M. Data Extraction and Management in Networks of Observational Health Care Databases for Scientific Research: A Comparison of EU-ADR, OMOP, Mini-Sentinel and MATRICE Strategies. *EGEMS (Wash DC)*. 2016;4(1):1189. Epub 20160208. doi: 10.13063/2327-9214.1189. PubMed PMID: 27014709; PubMed Central PMCID: PMC4780748.
76. Nissim N, Boland MR, Tatonetti NP, Elovici Y, Hripcsak G, Shahar Y, Moskovitch R. Improving condition severity classification with an efficient active learning based framework. *J Biomed Inform*. 2016;61:44-54. Epub 20160322. doi: 10.1016/j.jbi.2016.03.016. PubMed PMID: 27016383; PubMed Central PMCID: PMC5486916.
77. Weinstein RB, Schuemie MJ, Ryan PB, Stang PE. Seasonality in acute liver injury? Findings in two health care claims databases. *Drug Healthc Patient Saf*. 2016;8:39-48. Epub 20160331. doi: 10.2147/dhps.S95399. PubMed PMID: 27099532; PubMed Central PMCID: PMC4824282.
78. Agarwal V, Podchyska T, Banda JM, Goel V, Leung TI, Minty EP, Sweeney TE, Gyang E, Shah NH. Learning statistical models of phenotypes using noisy labeled training data. *J Am Med Inform Assoc*. 2016;23(6):1166-73. Epub 20160512. doi: 10.1093/jamia/ocw028. PubMed PMID: 27174893; PubMed Central PMCID: PMC5070523.
79. Banda JM, Evans L, Vanguri RS, Tatonetti NP, Ryan PB, Shah NH. A curated and standardized adverse drug event resource to accelerate drug safety research. *Sci Data*. 2016;3:160026. Epub 20160510. doi: 10.1038/sdata.2016.26. PubMed PMID: 27193236; PubMed Central PMCID: PMC4872271.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

80. Lambert CG, Mazurie AJ, Lauve NR, Hurwitz NG, Young SS, Obenchain RL, Hengartner NW, Perkins DJ, Tohen M, Kerner B. Hypothyroidism risk compared among nine common bipolar disorder therapies in a large US cohort. *Bipolar Disord*. 2016;18(3):247-60. doi: 10.1111/bdi.12391. PubMed PMID: 27226264; PubMed Central PMCID: PMC5089566.
81. Hripcsak G, Ryan PB, Duke JD, Shah NH, Park RW, Huser V, Suchard MA, Schuemie MJ, DeFalco FJ, Perotte A, Banda JM, Reich CG, Schilling LM, Matheny ME, Meeker D, Pratt N, Madigan D. Characterizing treatment pathways at scale using the OHDSI network. *Proc Natl Acad Sci U S A*. 2016;113(27):7329-36. Epub 20160606. doi: 10.1073/pnas.1510502113. PubMed PMID: 27274072; PubMed Central PMCID: PMC4941483.
82. Gruber S, Chakravarty A, Heckbert SR, Levenson M, Martin D, Nelson JC, Psaty BM, Pinheiro S, Reich CG, Toh S, Walker AM. Design and analysis choices for safety surveillance evaluations need to be tuned to the specifics of the hypothesized drug-outcome association. *Pharmacoepidemiol Drug Saf*. 2016;25(9):973-81. Epub 20160714. doi: 10.1002/pds.4065. PubMed PMID: 27418432.
83. Schuemie MJ, Hripcsak G, Ryan PB, Madigan D, Suchard MA. Robust empirical calibration of p-values using observational data. *Stat Med*. 2016;35(22):3883-8. doi: 10.1002/sim.6977. PubMed PMID: 27592566; PubMed Central PMCID: PMC5108459.
84. Sen A, Chakrabarti S, Goldstein A, Wang S, Ryan PB, Weng C. GIST 2.0: A scalable multi-trait metric for quantifying population representativeness of individual clinical studies. *J Biomed Inform*. 2016;63:325-36. Epub 20160904. doi: 10.1016/j.jbi.2016.09.003. PubMed PMID: 27600407; PubMed Central PMCID: PMC5077682.
85. Kahn MG, Callahan TJ, Barnard J, Bauck AE, Brown J, Davidson BN, Estiri H, Goerg C, Holve E, Johnson SG, Liaw ST, Hamilton-Lopez M, Meeker D, Ong TC, Ryan P, Shang N, Weiskopf NG, Weng C, Zozus MN, Schilling L. A Harmonized Data Quality Assessment Terminology and Framework for the Secondary Use of Electronic Health Record Data. *EGEMS (Wash DC)*. 2016;4(1):1244. Epub 20160911. doi: 10.13063/2327-9214.1244. PubMed PMID: 27713905; PubMed Central PMCID: PMC5051581.
86. Samwald M, Xu H, Blagec K, Empey PE, Malone DC, Ahmed SM, Ryan P, Hofer S, Boyce RD. Incidence of Exposure of Patients in the United States to Multiple Drugs for Which Pharmacogenomic Guidelines Are Available. *PLoS One*. 2016;11(10):e0164972. Epub 20161020. doi: 10.1371/journal.pone.0164972. PubMed PMID: 27764192; PubMed Central PMCID: PMC5072717.
87. Boyce RD, Handler SM, Karp JF, Perera S, Reynolds CF, 3rd. Preparing Nursing Home Data from Multiple Sites for Clinical Research - A Case Study Using Observational Health Data Sciences and Informatics. *EGEMS (Wash DC)*. 2016;4(1):1252. Epub 20161026. doi: 10.13063/2327-9214.1252. PubMed PMID: 27891528; PubMed Central PMCID: PMC5108634.
88. Gini R, Schuemie MJ, Mazzaglia G, Lapi F, Francesconi P, Pasqua A, Bianchini E, Montalbano C, Roberto G, Barletta V, Cricelli I, Cricelli C, Dal Co G, Bellentani M, Sturkenboom M, Klazinga N. Automatic identification of type 2 diabetes, hypertension, ischaemic heart disease, heart failure and their levels of severity from Italian General Practitioners' electronic medical records: a validation study. *BMJ Open*. 2016;6(12):e012413. Epub 20161209. doi: 10.1136/bmjopen-2016-012413. PubMed PMID: 27940627; PubMed Central PMCID: PMC5168667.
89. Garza M, Del Fiol G, Tenenbaum J, Walden A, Zozus MN. Evaluating common data models for use with a longitudinal community registry. *J Biomed Inform*. 2016;64:333-41. Epub 20161029. doi: 10.1016/j.jbi.2016.10.016. PubMed PMID: 27989817; PubMed Central PMCID: PMC6810649.
90. Huser V, DeFalco FJ, Schuemie M, Ryan PB, Shang N, Velez M, Park RW, Boyce RD, Duke J, Khare R, Utidjian L, Bailey C. Multisite Evaluation of a Data Quality Tool for Patient-Level Clinical Data Sets. *EGEMS (Wash DC)*. 2016;4(1):1239. Epub 20161130. doi: 10.13063/2327-9214.1239. PubMed PMID: 28154833; PubMed Central PMCID: PMC5226382.
91. Kim H, Choi J, Jang I, Quach J, Ohno-Machado L. Feasibility of Representing Data from Published Nursing Research Using the OMOP Common Data Model. *AMIA Annu Symp Proc*. 2016;2016:715-23. Epub 20170210. PubMed PMID: 28269868; PubMed Central PMCID: PMC5333244.
92. Shaddox TR, Ryan PB, Schuemie MJ, Madigan D, Suchard MA. Hierarchical Models for Multiple, Rare Outcomes Using Massive Observational Healthcare Databases. *Stat Anal Data Min*. 2016;9(4):260-8. Epub 20160717. doi: 10.1002/sam.11324. PubMed PMID: 28503249; PubMed Central PMCID: PMC5423675.
93. Voss EA, Boyce RD, Ryan PB, van der Lei J, Rijnbeek PR, Schuemie MJ. Accuracy of an automated knowledge base for identifying drug adverse reactions. *J Biomed Inform*. 2017;66:72-81. Epub 20161216. doi: 10.1016/j.jbi.2016.12.005. PubMed PMID: 27993747; PubMed Central PMCID: PMC5316295.
94. Boland MR, Karczewski KJ, Tatonetti NP. Ten Simple Rules to Enable Multi-site Collaborations through Data Sharing. *PLoS Comput Biol*. 2017;13(1):e1005278. Epub 20170119. doi: 10.1371/journal.pcbi.1005278. PubMed PMID: 28103227; PubMed Central PMCID: PMC5245793.
95. Ryan PB, Schuemie MJ, Ramcharran D, Stang PE. Atypical Antipsychotics and the Risks of Acute Kidney Injury and Related Outcomes Among Older Adults: A Replication Analysis and an Evaluation of Adapted Confounding Control Strategies. *Drugs Aging*. 2017;34(3):211-9. doi: 10.1007/s40266-016-0430-x. PubMed PMID: 28124262.
96. Ramcharran D, Qiu H, Schuemie MJ, Ryan PB. Atypical Antipsychotics and the Risk of Falls and Fractures Among Older Adults: An Emulation Analysis and an Evaluation of Additional Confounding Control Strategies. *J Clin Psychopharmacol*. 2017;37(2):162-8. doi: 10.1097/jcp.0000000000000647. PubMed PMID: 28225746.
97. Park RW. Sharing Clinical Big Data While Protecting Confidentiality and Security: Observational Health Data Sciences and Informatics. *Healthc Inform Res*. 2017;23(1):1-3. Epub 20170131. doi: 10.4258/hir.2017.23.1.1. PubMed PMID: 28261525; PubMed Central PMCID: PMC5334126.
98. Large-scale adverse effects related to treatment evidence standardization (LAERTES): an open scalable system for linking pharmacovigilance evidence sources with clinical data. *J Biomed Semantics*. 2017;8(1):11. Epub 20170307. doi: 10.1186/s13326-017-0115-3. PubMed PMID: 28270198; PubMed Central PMCID: PMC5341176.
99. Kang T, Zhang S, Tang Y, Hruby GW, Rusanov A, Elhadad N, Weng C. EliIE: An open-source information extraction system for clinical trial eligibility criteria. *J Am Med Inform Assoc*. 2017;24(6):1062-71. doi: 10.1093/jamia/ocx019. PubMed PMID: 28379377; PubMed Central PMCID: PMC6259668.
100. Yuan Z, Voss EA, DeFalco FJ, Pan G, Ryan PB, Yannicelli D, Nessel C. Risk Prediction for Ischemic Stroke and Transient Ischemic Attack in Patients Without Atrial Fibrillation: A Retrospective Cohort Study. *J Stroke Cerebrovasc Dis*. 2017;26(8):1721-31. Epub 20170406. doi: 10.1016/j.jstrokecerebrovasdis.2017.03.036. PubMed PMID: 28392100.
101. Khare R, Utidjian L, Ruth BJ, Kahn MG, Burrows E, Marsolo K, Patibandla N, Razzaghi H, Colvin R, Ranade D, Kitzmiller M, Eckrich D, Bailey LC. A longitudinal analysis of data quality in a large pediatric data research network. *J Am Med Inform Assoc*. 2017;24(6):1072-9. doi: 10.1093/jamia/ocx033. PubMed PMID: 28398525; PubMed Central PMCID: PMC6259665.
102. Wang Y, Desai M, Ryan PB, DeFalco FJ, Schuemie MJ, Stang PE, Berlin JA, Yuan Z. Incidence of diabetic ketoacidosis among patients with type 2 diabetes mellitus treated with SGLT2 inhibitors and other antihyperglycemic agents. *Diabetes Res Clin Pract*. 2017;128:83-90. Epub 20170413. doi: 10.1016/j.diabres.2017.04.004. PubMed PMID: 28448895.
103. Nissim N, Shahar Y, Elovici Y, Hripcsak G, Moskovitch R. Inter-labeler and intra-labeler variability of condition severity classification models using active and passive learning methods. *Artif Intell Med*. 2017;81:12-32. Epub 20170427. doi: 10.1016/j.artmed.2017.03.003. PubMed PMID: 28456512; PubMed Central PMCID: PMC5937023.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	119	124	108	167

104. Ceusters W, Blaisure J. A Realism-Based View on Counts in OMOP's Common Data Model. *Stud Health Technol Inform.* 2017;237:55-62. PubMed PMID: 28479543.
105. Duke JD, Ryan PB, Suchard MA, Hripscak G, Jin P, Reich C, Schwalm MS, Khoma Y, Wu Y, Xu H, Shah NH, Banda JM, Schuemie MJ. Risk of angioedema associated with levetiracetam compared with phenytoin: Findings of the observational health data sciences and informatics research network. *Epilepsia.* 2017;58(8):e101-e6. Epub 20170706. doi: 10.1111/epi.13828. PubMed PMID: 28681416; PubMed Central PMCID: PMC6632067.
106. Chakrabarti S, Sen A, Huser V, Hruby GW, Rusanov A, Albers DJ, Weng C. An Interoperable Similarity-based Cohort Identification Method Using the OMOP Common Data Model version 5.0. *J Healthc Inform Res.* 2017;1(1):1-18. Epub 20170608. doi: 10.1007/s41666-017-0005-6. PubMed PMID: 28776047; PubMed Central PMCID: PMC5536903.
107. Weinstein RB, Ryan P, Berlin JA, Matcho A, Schuemie M, Swerdel J, Patel K, Fife D. Channeling in the Use of Nonprescription Paracetamol and Ibuprofen in an Electronic Medical Records Database: Evidence and Implications. *Drug Saf.* 2017;40(12):1279-92. doi: 10.1007/s40264-017-0581-7. PubMed PMID: 28780741; PubMed Central PMCID: PMC5688206.
108. Banda JM, Halpern Y, Sontag D, Shah NH. Electronic phenotyping with APHRODITE and the Observational Health Sciences and Informatics (OHDSI) data network. *AMIA Jt Summits Transl Sci Proc.* 2017;2017:48-57. Epub 20170726. PubMed PMID: 28815104; PubMed Central PMCID: PMC5543379.
109. Moskovitch R, Polubriaginof F, Weiss A, Ryan P, Tatonetti N. Procedure prediction from symbolic Electronic Health Records via time intervals analytics. *J Biomed Inform.* 2017;75:70-82. Epub 20170817. doi: 10.1016/j.jbi.2017.07.018. PubMed PMID: 28823923.
110. Ong TC, Kahn MG, Kwan BM, Yamashita T, Brandt E, Hosokawa P, Uhrich C, Schilling LM. Dynamic-ETL: a hybrid approach for health data extraction, transformation and loading. *BMC Med Inform Decis Mak.* 2017;17(1):134. Epub 20170913. doi: 10.1186/s12911-017-0532-3. PubMed PMID: 28903729; PubMed Central PMCID: PMC5598056.
111. Rosenbloom ST, Carroll RJ, Warner JL, Matheny ME, Denny JC. Representing Knowledge Consistently Across Health Systems. *Yearb Med Inform.* 2017;26(1):139-47. Epub 20170911. doi: 10.15265/iy-2017-018. PubMed PMID: 29063555; PubMed Central PMCID: PMC6239235.
112. Harpaz R, DuMouchel W, Schuemie M, Bodenreider O, Friedman C, Horvitz E, Ripple A, Sorbello A, White RW, Winnenburg R, Shah NH. Toward multimodal signal detection of adverse drug reactions. *J Biomed Inform.* 2017;76:41-9. Epub 20171101. doi: 10.1016/j.jbi.2017.10.013. PubMed PMID: 29081385; PubMed Central PMCID: PMC8502488.
113. Gini R, Schuemie MJ, Pasqua A, Carlini E, Profili F, Cricelli I, Dazzi P, Barletta V, Francesconi P, Lapi F, Donatini A, Dal Co G, Visca M, Bellentani M, Sturkenboom M, Klazinga N. Monitoring compliance with standards of care for chronic diseases using healthcare administrative databases in Italy: Strengths and limitations. *PLoS One.* 2017;12(12):e0188377. Epub 20171212. doi: 10.1371/journal.pone.0188377. PubMed PMID: 29232365; PubMed Central PMCID: PMC5726627.
114. You SC, Lee S, Cho SY, Park H, Jung S, Cho J, Yoon D, Park RW. Conversion of National Health Insurance Service-National Sample Cohort (NHIS-NSC) Database into Observational Medical Outcomes Partnership-Common Data Model (OMOP-CDM). *Stud Health Technol Inform.* 2017;245:467-70. PubMed PMID: 29295138.
115. Jiang G, Kiefer RC, Sharma DK, Prud'hommeaux E, Solbrig HR. A Consensus-Based Approach for Harmonizing the OHDSI Common Data Model with HL7 FHIR. *Stud Health Technol Inform.* 2017;245:887-91. PubMed PMID: 29295227; PubMed Central PMCID: PMC5939955.
116. Si Y, Weng C. An OMOP CDM-Based Relational Database of Clinical Research Eligibility Criteria. *Stud Health Technol Inform.* 2017;245:950-4. PubMed PMID: 29295240; PubMed Central PMCID: PMC5893219.
117. Jiang G, Kiefer R, Prud'hommeaux E, Solbrig HR. Building Interoperable FHIR-Based Vocabulary Mapping Services: A Case Study of OHDSI Vocabularies and Mappings. *Stud Health Technol Inform.* 2017;245:1327. PubMed PMID: 29295408; PubMed Central PMCID: PMC5939959.
118. Kuang Z, Peissig P, Costa VS, Maclin R, Page D. Pharmacovigilance via Baseline Regularization with Large-Scale Longitudinal Observational Data. *Kdd.* 2017;2017:1537-46. doi: 10.1145/3097983.3097998. PubMed PMID: 29755826; PubMed Central PMCID: PMC5945223.
119. Blaisure JC, Ceusters WM. Improving the 'Fitness for Purpose' of Common Data Models through Realism Based Ontology. *AMIA Annu Symp Proc.* 2017;2017:440-7. Epub 20180416. PubMed PMID: 29854108; PubMed Central PMCID: PMC5977618.
120. Callahan TJ, Bauck AE, Bertoch D, Brown J, Khare R, Ryan PB, Staab J, Zozus MN, Kahn MG. A Comparison of Data Quality Assessment Checks in Six Data Sharing Networks. *EGEMS (Wash DC).* 2017;5(1):8. Epub 20170612. doi: 10.5334/egems.223. PubMed PMID: 29881733; PubMed Central PMCID: PMC5982846.
121. Callahan T, Barnard J, Helmkamp L, Maertens J, Kahn M. Reporting Data Quality Assessment Results: Identifying Individual and Organizational Barriers and Solutions. *EGEMS (Wash DC).* 2017;5(1):16. Epub 20170904. doi: 10.5334/egems.214. PubMed PMID: 29881736; PubMed Central PMCID: PMC5982990.
122. Yang Y, Zhou X, Gao S, Lin H, Xie Y, Feng Y, Huang K, Zhan S. Evaluation of Electronic Healthcare Databases for Post-Marketing Drug Safety Surveillance and Pharmacoepidemiology in China. *Drug Saf.* 2018;41(1):125-37. doi: 10.1007/s40264-017-0589-z. PubMed PMID: 28815480.
123. Yuan Z, DeFalco FJ, Ryan PB, Schuemie MJ, Stang PE, Berlin JA, Desai M, Rosenthal N. Risk of lower extremity amputations in people with type 2 diabetes mellitus treated with sodium-glucose co-transporter-2 inhibitors in the USA: A retrospective cohort study. *Diabetes Obes Metab.* 2018;20(3):582-9. Epub 20171011. doi: 10.1111/dom.13115. PubMed PMID: 28898514; PubMed Central PMCID: PMC5836890.
124. Boland MR, Parhi P, Li L, Miotto R, Carroll R, Iqbal U, Nguyen PA, Schuemie M, You SC, Smith D, Mooney S, Ryan P, Li YJ, Park RW, Denny J, Dudley JT, Hripscak G, Gentile P, Tatonetti NP. Uncovering exposures responsible for birth season - disease effects: a global study. *J Am Med Inform Assoc.* 2018;25(3):275-88. doi: 10.1093/jamia/ocx105. PubMed PMID: 29036387; PubMed Central PMCID: PMC7282503.
125. Hripscak G, Albers DJ. High-fidelity phenotyping: richness and freedom from bias. *J Am Med Inform Assoc.* 2018;25(3):289-94. doi: 10.1093/jamia/ocx110. PubMed PMID: 29040596; PubMed Central PMCID: PMC7282504.
126. Zhou X, Bao W, Gaffney M, Shen R, Young S, Bate A. Assessing performance of sequential analysis methods for active drug safety surveillance using observational data. *J Biopharm Stat.* 2018;28(4):668-81. Epub 20171120. doi: 10.1080/10543406.2017.1372776. PubMed PMID: 29157113.
127. Huser V, Kahn MG, Brown JS, Gouripeddi R. Methods for examining data quality in healthcare integrated data repositories. *Pac Symp Biocomput.* 2018;23:628-33. PubMed PMID: 29218922.
128. Maier C, Lang L, Storf H, Vormstein P, Bieber R, Bernarding J, Herrmann T, Haverkamp C, Horki P, Laufer J, Berger F, Höning G, Fritsch HW, Schüttler J, Ganslandt T, Prokosch HU, Sedlmayr M. Towards Implementation of OMOP in a German University Hospital Consortium. *Appl Clin Inform.* 2018;9(1):54-61. Epub 20180124. doi: 10.1055/s-0037-1617452. PubMed PMID: 29365340; PubMed Central PMCID: PMC5801887.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	38	46	79	112	124	108	107

129. Matcho A, Ryan P, Fife D, Gifkins D, Knoll C, Friedman A. Inferring pregnancy episodes and outcomes within a network of observational databases. *PLoS One*. 2018;13(2):e0192033. Epub 20180201. doi: 10.1371/journal.pone.0192033. PubMed PMID: 29389968; PubMed Central PMCID: PMC5794136.

130. Whalen E, Hauben M, Bate A. Time Series Disturbance Detection for Hypothesis-Free Signal Detection in Longitudinal Observational Databases. *Drug Saf*. 2018;41(6):565-77. doi: 10.1007/s40264-018-0640-8. PubMed PMID: 29468602.

131. Sun YX, Pei ZC, Zhan SY. [Data harmonization and sharing in study cohorts of respiratory diseases]. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2018;39(2):233-9. doi: 10.3760/cma.j.issn.0254-6450.2018.02.019. PubMed PMID: 29495212.

132. Schuemie MJ, Hripcsak G, Ryan PB, Madigan D, Suchard MA. Empirical confidence interval calibration for population-level effect estimation studies in observational healthcare data. *Proc Natl Acad Sci U S A*. 2018;115(11):2571-7. doi: 10.1073/pnas.1708282114. PubMed PMID: 29531023; PubMed Central PMCID: PMC5856503.

133. Cho S, Mohan S, Husain SA, Natarajan K. Expanding transplant outcomes research opportunities through the use of a common data model. *Am J Transplant*. 2018;18(6):1321-7. Epub 20180522. doi: 10.1111/ajt.14892. PubMed PMID: 29687963; PubMed Central PMCID: PMC6070138.

134. Reps JM, Schuemie MJ, Suchard MA, Ryan PB, Rijnbeek PR. Design and implementation of a standardized framework to generate and evaluate patient-level prediction models using observational healthcare data. *J Am Med Inform Assoc*. 2018;25(8):969-75. doi: 10.1093/jamia/ocy032. PubMed PMID: 29718407; PubMed Central PMCID: PMC6077830.

135. Rinner C, Gezgin D, Wendl C, Gall W. A Clinical Data Warehouse Based on OMOP and i2b2 for Austrian Health Claims Data. *Stud Health Technol Inform*. 2018;248:94-9. PubMed PMID: 29726424.

136. Pembroke CA, Fortin B, Kopek N. Comparison of survival and prognostic factors in patients treated with stereotactic body radiotherapy for oligometastases or oligoprogression. *Radiother Oncol*. 2018;127(3):493-500. Epub 20180504. doi: 10.1016/j.radonc.2018.04.022. PubMed PMID: 29735409.

137. Pacaci A, Gonul S, Sinaci AA, Yuksel M, Laleci Erturkmen GB. A Semantic Transformation Methodology for the Secondary Use of Observational Healthcare Data in Post-marketing Safety Studies. *Front Pharmacol*. 2018;9:435. Epub 20180430. doi: 10.3389/fphar.2018.00435. PubMed PMID: 29760661; PubMed Central PMCID: PMC5937227.

138. Polubriaginof FCG, Vanguri R, Quinnes K, Belbin GM, Yahi A, Salmasian H, Lorberbaum T, Nwankwo V, Li L, Shervey MM, Glowpe P, Ionita-Laza I, Simmerling M, Hripcsak G, Bakken S, Goldstein D, Kiryluk K, Kenny EE, Dudley J, Vawdrey DK, Tatonetti NP. Disease Heritability Inferred from Familial Relationships Reported in Medical Records. *Cell*. 2018;173(7):1692-704.e11. Epub 20180517. doi: 10.1016/j.cell.2018.04.032. PubMed PMID: 29779949; PubMed Central PMCID: PMC6015747.

139. Cepeda MS, Reps J, Ryan P. Finding factors that predict treatment-resistant depression: Results of a cohort study. *Depress Anxiety*. 2018;35(7):668-73. Epub 20180522. doi: 10.1002/da.22774. PubMed PMID: 29786922; PubMed Central PMCID: PMC6055726.

140. Butler A, Wei W, Yuan C, Kang T, Si Y, Weng C. The Data Gap in the EHR for Clinical Research Eligibility Screening. *AMIA Jt Summits Transl Sci Proc*. 2018;2017:320-9. Epub 20180518. PubMed PMID: 29888090; PubMed Central PMCID: PMC5961795.

141. Nestsiarovich A, Mazurie AJ, Hurwitz NG, Kerner B, Nelson SJ, Crisanti AS, Tohen M, Krall RL, Perkins DJ, Lambert CG. Comprehensive comparison of monotherapies for psychiatric hospitalization risk in bipolar disorders. *Bipolar Disord*. 2018;20(8):761-71. Epub 20180619. doi: 10.1111/bdi.12665. PubMed PMID: 29920885; PubMed Central PMCID: PMC6586061.

142. Ryan PB, Buse JB, Schuemie MJ, DeFalco F, Yuan Z, Stang PE, Berlin JA, Rosenthal N. Comparative effectiveness of canagliflozin, SGLT2 inhibitors and non-SGLT2 inhibitors on the risk of hospitalization for heart failure and amputation in patients with type 2 diabetes mellitus: A real-world meta-analysis of 4 observational databases (OBSERVE-4D). *Diabetes Obes Metab*. 2018;20(11):2585-97. Epub 20180625. doi: 10.1111/dom.13424. PubMed PMID: 29938883; PubMed Central PMCID: PMC6220807.

143. Tian Y, Schuemie MJ, Suchard MA. Evaluating large-scale propensity score performance through real-world and synthetic data experiments. *Int J Epidemiol*. 2018;47(6):2005-14. doi: 10.1093/ije/dyy120. PubMed PMID: 29939268; PubMed Central PMCID: PMC6280944.

144. Mower J, Subramanian D, Cohen T. Learning predictive models of drug side-effect relationships from distributed representations of literature-derived semantic predications. *J Am Med Inform Assoc*. 2018;25(10):1339-50. doi: 10.1093/jamia/ocy077. PubMed PMID: 30010902; PubMed Central PMCID: PMC6454491.

145. Prokosch HU, Acker T, Bernarding J, Binder H, Boeker M, Boerries M, Daumke P, Ganslandt T, Hesser J, Höning G, Neumaier M, Marquardt K, Renz H, Rothkötter HJ, Schade-Brittinger C, Schmücker P, Schüttler J, Sedlmayr M, Serve H, Sohrabi K, Storf H. MIRACUM: Medical Informatics in Research and Care in University Medicine. *Methods Inf Med*. 2018;57(S 01):e82-e91. Epub 20180717. doi: 10.3414/me17-02-0025. PubMed PMID: 30016814; PubMed Central PMCID: PMC6178200.

146. Schuemie MJ, Ryan PB, Hripcsak G, Madigan D, Suchard MA. Improving reproducibility by using high-throughput observational studies with empirical calibration. *Philos Trans A Math Phys Eng Sci*. 2018;376(2128). doi: 10.1098/rsta.2017.0356. PubMed PMID: 30082302; PubMed Central PMCID: PMC6107542.

147. Klann JG, Phillips LC, Herrick C, Joss MAH, Waghlikar KB, Murphy SN. Web services for data warehouses: OMOP and PCORnet on i2b2. *J Am Med Inform Assoc*. 2018;25(10):1331-8. doi: 10.1093/jamia/ocy093. PubMed PMID: 30085008; PubMed Central PMCID: PMC6188504.

148. Lai EC, Ryan P, Zhang Y, Schuemie M, Hardy NC, Kamijima Y, Kimura S, Kubota K, Man KK, Cho SY, Park RW, Stang P, Su CC, Wong IC, Kao YY, Setoguchi S. Applying a common data model to Asian databases for multinational pharmacoepidemiologic studies: opportunities and challenges. *Clin Epidemiol*. 2018;10:875-85. Epub 20180727. doi: 10.2147/clep.S149961. PubMed PMID: 30100761; PubMed Central PMCID: PMC6067778.

149. Levine ME, Albers DJ, Hripcsak G. Methodological variations in lagged regression for detecting physiologic drug effects in EHR data. *J Biomed Inform*. 2018;86:149-59. Epub 20180830. doi: 10.1016/j.jbi.2018.08.014. PubMed PMID: 30172760; PubMed Central PMCID: PMC6207533.

150. Liyanage H, Liaw ST, Jonnagaddala J, Hinton W, de Lusignan S. Common Data Models (CDMs) to Enhance International Big Data Analytics: A Diabetes Use Case to Compare Three CDMs. *Stud Health Technol Inform*. 2018;255:60-4. PubMed PMID: 30306907.

151. Elkin PL, Mullin S, Sakilay S. Biomedical Informatics Investigator. *Stud Health Technol Inform*. 2018;255:195-9. PubMed PMID: 30306935; PubMed Central PMCID: PMC7847179.

152. Hripcsak G, Levine ME, Shang N, Ryan PB. Effect of vocabulary mapping for conditions on phenotype cohorts. *J Am Med Inform Assoc*. 2018;25(12):1618-25. doi: 10.1093/jamia/ocy124. PubMed PMID: 30395248; PubMed Central PMCID: PMC6289550.

153. Zhang X, Wang L, Miao S, Xu H, Yin Y, Zhu Y, Dai Z, Shan T, Jing S, Wang J, Zhang X, Huang Z, Wang Z, Guo J, Liu Y. Analysis of treatment pathways for three chronic diseases using OMOP CDM. *J Med Syst*. 2018;42(12):260. Epub 20181113. doi: 10.1007/s10916-018-1076-5. PubMed PMID: 30421323; PubMed Central PMCID: PMC6244882.

154. Ta CN, Dumontier M, Hripcsak G, Tatonetti NP, Weng C. Columbia Open Health Data, clinical concept prevalence and co-occurrence from electronic health records. *Sci Data*. 2018;5:180273. Epub 20181127. doi: 10.1038/sdata.2018.273. PubMed PMID: 30480666; PubMed Central PMCID: PMC6257042.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	38	46	79	112	124	108	167

OHDSI PUBLICATIONS

155. Hong N, Zhang N, Wu H, Lu S, Yu Y, Hou L, Lu Y, Liu H, Jiang G. Preliminary exploration of survival analysis using the OHDSI common data model: a case study of intrahepatic cholangiocarcinoma. *BMC Med Inform Decis Mak.* 2018;18(Suppl 5):116. Epub 20181207. doi: 10.1186/s12911-018-0686-7. PubMed PMID: 30526572; PubMed Central PMCID: PMC6284277.
156. Kubota K, Kamijima Y, Kao Yang YH, Kimura S, Chia-Cheng Lai E, Man KKC, Ryan P, Schuemie M, Stang P, Su CC, Wong ICK, Zhang Y, Setoguchi S. Penetration of new antidiabetic medications in East Asian countries and the United States: A cross-national comparative study. *PLoS One.* 2018;13(12):e0208796. Epub 20181212. doi: 10.1371/journal.pone.0208796. PubMed PMID: 30540837; PubMed Central PMCID: PMC6291148.
157. Vashisth R, Jung K, Schuler A, Banda JM, Park RW, Jin S, Li L, Dudley JT, Johnson KW, Shervey MM, Xu H, Wu Y, Natrajan K, Hripcsak G, Jin P, Van Zandt M, Reckard A, Reich CG, Weaver J, Schuemie MJ, Ryan PB, Callahan A, Shah NH. Association of Hemoglobin A1c Levels With Use of Sulfonylureas, Dipeptidyl Peptidase 4 Inhibitors, and Thiazolidinediones in Patients With Type 2 Diabetes Treated With Metformin: Analysis From the Observational Health Data Sciences and Informatics Initiative. *JAMA Netw Open.* 2018;1(4):e181755. Epub 20180803. doi: 10.1001/jamanetworkopen.2018.1755. PubMed PMID: 30646124; PubMed Central PMCID: PMC6324274.
158. Gold S, Batch A, McClure R, Jiang G, Kharrazi H, Saripalle R, Huser V, Weng C, Roderer N, Szarfman A, Elmquist N, Gotz D. Clinical Concept Value Sets and Interoperability in Health Data Analytics. *AMIA Annu Symp Proc.* 2018;2018:480-9. Epub 20181205. PubMed PMID: 30815088; PubMed Central PMCID: PMC6371254.
159. Seneviratne MG, Banda JM, Brooks JD, Shah NH, Hernandez-Boussard TM. Identifying Cases of Metastatic Prostate Cancer Using Machine Learning on Electronic Health Records. *AMIA Annu Symp Proc.* 2018;2018:1498-504. Epub 20181205. PubMed PMID: 30815195; PubMed Central PMCID: PMC6371284.
160. Yu Y, Ruddy KJ, Hong N, Tsuji S, Wen A, Shah ND, Jiang G. ADEpedia-on-OHDSI: A next generation pharmacovigilance signal detection platform using the OHDSI common data model. *J Biomed Inform.* 2019;91:103119. Epub 20190207. doi: 10.1016/j.jbi.2019.103119. PubMed PMID: 30738946; PubMed Central PMCID: PMC6432939.
161. Yuan C, Ryan PB, Ta C, Guo Y, Li Z, Hardin J, Makadia R, Jin P, Shang N, Kang T, Weng C. Criteria2Query: a natural language interface to clinical databases for cohort definition. *J Am Med Inform Assoc.* 2019;26(4):294-305. doi: 10.1093/jamia/ocy178. PubMed PMID: 30753493; PubMed Central PMCID: PMC6402359.
162. Pham M, Cheng F, Ramachandran K. A Comparison Study of Algorithms to Detect Drug-Adverse Event Associations: Frequentist, Bayesian, and Machine-Learning Approaches. *Drug Saf.* 2019;42(6):743-50. doi: 10.1007/s40264-018-00792-0. PubMed PMID: 30762164.
163. Borghetti P, Bonù ML, Giubolini R, Levra NG, Mazzola R, Perna M, Visani L, Meacci F, Taraborrelli M, Triggiani L, Franceschini D, Greco C, Bruni A, Magrini SM, Scotti V. Concomitant radiotherapy and TKI in metastatic EGFR- or ALK-mutated non-small cell lung cancer: a multicentric analysis on behalf of AIRO lung cancer study group. *Radiol Med.* 2019;124(7):662-70. Epub 20190215. doi: 10.1007/s11547-019-00999-w. PubMed PMID: 30771218.
164. Klann JG, Joss MAH, Embree K, Murphy SN. Data model harmonization for the All Of Us Research Program: Transforming i2b2 data into the OMOP common data model. *PLoS One.* 2019;14(2):e0212463. Epub 20190219. doi: 10.1371/journal.pone.0212463. PubMed PMID: 30779778; PubMed Central PMCID: PMC6380544.
165. Ross EG, Jung K, Dudley JT, Li L, Leeper NJ, Shah NH. Predicting Future Cardiovascular Events in Patients With Peripheral Artery Disease Using Electronic Health Record Data. *Circ Cardiovasc Qual Outcomes.* 2019;12(3):e004741. doi: 10.1161/circoutcomes.118.004741. PubMed PMID: 30857412; PubMed Central PMCID: PMC6415677.
166. Shin SJ, You SC, Park YR, Roh J, Kim JH, Haam S, Reich CG, Blacketer C, Son DS, Oh S, Park RW. Genomic Common Data Model for Seamless Interoperation of Biomedical Data in Clinical Practice: Retrospective Study. *J Med Internet Res.* 2019;21(3):e13249. Epub 20190326. doi: 10.2196/13249. PubMed PMID: 30912749; PubMed Central PMCID: PMC6454347.
167. Weeks J, Pardee R. Learning to Share Health Care Data: A Brief Timeline of Influential Common Data Models and Distributed Health Data Networks in U.S. Health Care Research. *EGEMS (Wash DC).* 2019;7(1):4. Epub 20190325. doi: 10.5334/egems.279. PubMed PMID: 30937326; PubMed Central PMCID: PMC6437693.
168. Haberson A, Rinner C, Gall W. Standardizing Austrians Claims Data Using the OMOP Common Data Model: A Feasibility Study. *Stud Health Technol Inform.* 2019;258:151-2. PubMed PMID: 30942734.
169. Sharma H, Mao C, Zhang Y, Vatani H, Yao L, Zhong Y, Rasmussen L, Jiang G, Pathak J, Luo Y. Developing a portable natural language processing based phenotyping system. *BMC Med Inform Decis Mak.* 2019;19(Suppl 3):78. Epub 20190404. doi: 10.1186/s12911-019-0786-z. PubMed PMID: 30943974; PubMed Central PMCID: PMC6448187.
170. Reys JM, Rijnbeek PR, Ryan PB. Identifying the DEAD: Development and Validation of a Patient-Level Model to Predict Death Status in Population-Level Claims Data. *Drug Saf.* 2019;42(11):1377-86. doi: 10.1007/s40264-019-00827-0. PubMed PMID: 31054141; PubMed Central PMCID: PMC6834730.
171. Rogers JR, Callahan TJ, Kang T, Bauck A, Khare R, Brown JS, Kahn MG, Weng C. A Data Element-Function Conceptual Model for Data Quality Checks. *EGEMS (Wash DC).* 2019;7(1):17. Epub 20190423. doi: 10.5334/egems.289. PubMed PMID: 31065558; PubMed Central PMCID: PMC6484368.
172. Schuemie MJ, Madigan D, Ryan PB, Reich C, Suchard MA, Berlin JA, Hripcsak G. Comment on "How pharmacoepidemiology networks can manage distributed analyses to improve replicability and transparency and minimize bias". *Pharmacoepidemiol Drug Saf.* 2019;28(7):1032-3. Epub 20190508. doi: 10.1002/pds.4798. PubMed PMID: 31066478.
173. Johnston SS, Morton JM, Kalsekar I, Ammann EM, Hsiao CW, Reys J. Using Machine Learning Applied to Real-World Healthcare Data for Predictive Analytics: An Applied Example in Bariatric Surgery. *Value Health.* 2019;22(5):580-6. doi: 10.1016/j.jval.2019.01.011. PubMed PMID: 31104738.
174. Glicksberg BS, Oskotsky B, Thangaraj PM, Giangreco N, Badgeley MA, Johnson KW, Datta D, Rudrapatna VA, Rappoport N, Shervey MM, Miotto R, Goldstein TC, Rutenberg E, Frazier R, Lee N, Israni S, Larsen R, Percha B, Li L, Dudley JT, Tatonetti NP, Butte AJ. PatientExploreR: an extensible application for dynamic visualization of patient clinical history from electronic health records in the OMOP common data model. *Bioinformatics.* 2019;35(21):4515-8. doi: 10.1093/bioinformatics/btz409. PubMed PMID: 31214700; PubMed Central PMCID: PMC6821222.
175. Warner JL, Dymshyts D, Reich CG, Gurley MJ, Hochheiser H, Moldwin ZH, Belenkaya R, Williams AE, Yang PC. HemOnc: A new standard vocabulary for chemotherapy regimen representation in the OMOP common data model. *J Biomed Inform.* 2019;96:103239. Epub 20190622. doi: 10.1016/j.jbi.2019.103239. PubMed PMID: 31238109; PubMed Central PMCID: PMC6697579.
176. Banda JM, Sarraju A, Abbasi F, Parizo J, Pariani M, Ison H, Briskin E, Wand H, Dubois S, Jung K, Myers SA, Rader DJ, Leader JB, Murray MF, Myers KD, Wilemon K, Shah NH, Knowles JW. Finding missed cases of familial hypercholesterolemia in health systems using machine learning. *NPJ Digit Med.* 2019;2:23. Epub 20190411. doi: 10.1038/s41746-019-0101-5. PubMed PMID: 31304370; PubMed Central PMCID: PMC6550268.
177. Banda JM. Fully connecting the Observational Health Data Science and Informatics (OHDSI) initiative with the world of linked open data. *Genomics Inform.* 2019;17(2):e13. Epub 20190611. doi: 10.5808/GI.2019.17.2.e13. PubMed PMID: 31307128; PubMed Central PMCID: PMC6808628.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	38	46	79	112	124	108	107

178. Hripcsak G, Shang N, Peissig PL, Rasmussen LV, Liu C, Benoit B, Carroll RJ, Carrell DS, Denny JC, Dikilitas O, Gainer VS, Howell KM, Klann JG, Kullo IJ, Lingren T, Mentch FD, Murphy SN, Natarajan K, Pacheco JA, Wei WQ, Wiley K, Weng C. Facilitating phenotype transfer using a common data model. *J Biomed Inform.* 2019;96:103253. Epub 20190717. doi: 10.1016/j.jbi.2019.103253. PubMed PMID: 31325501; PubMed Central PMCID: PMC6697565.
179. Polubriaginof FCG, Ryan P, Salmasian H, Shapiro AW, Perotte A, Safford MM, Hripcsak G, Smith S, Tatonetti NP, Vawdrey DK. Challenges with quality of race and ethnicity data in observational databases. *J Am Med Inform Assoc.* 2019;26(8-9):730-6. doi: 10.1093/jamia/ocz113. PubMed PMID: 31365089; PubMed Central PMCID: PMC6696496.
180. Sobel RE, Blackwell W, Fram DM, Bate A. A Novel Approach to Visualize Risk Minimization Effectiveness: Peeping at the 2012 UK Proton Pump Inhibitor Label Change Using a Rapid Cycle Analysis Tool. *Drug Saf.* 2019;42(11):1365-76. doi: 10.1007/s40264-019-00853-y. PubMed PMID: 31368080.
181. Swerdel JN, Hripcsak G, Ryan PB. PheValuator: Development and evaluation of a phenotype algorithm evaluator. *J Biomed Inform.* 2019;97:103258. Epub 20190729. doi: 10.1016/j.jbi.2019.103258. PubMed PMID: 31369862; PubMed Central PMCID: PMC7736922.
182. Reys JM, Rijnbeek PR, Ryan PB. Supplementing claims data analysis using self-reported data to develop a probabilistic phenotype model for current smoking status. *J Biomed Inform.* 2019;97:103264. Epub 20190803. doi: 10.1016/j.jbi.2019.103264. PubMed PMID: 31386904.
183. Schuemie MJ, Ryan PB, Man KKC, Wong ICK, Suchard MA, Hripcsak G. A plea to stop using the case-control design in retrospective database studies. *Stat Med.* 2019;38(22):4199-208. Epub 20190822. doi: 10.1002/sim.8215. PubMed PMID: 31436848; PubMed Central PMCID: PMC6771795.
184. Lima DM, Rodrigues-Jr JF, Traina AJM, Pires FA, Gutierrez MA. Transforming Two Decades of ePR Data to OMOP CDM for Clinical Research. *Stud Health Technol Inform.* 2019;264:233-7. doi: 10.3233/shti190218. PubMed PMID: 31437920.
185. Ta CN, Weng C. Detecting Systemic Data Quality Issues in Electronic Health Records. *Stud Health Technol Inform.* 2019;264:383-7. doi: 10.3233/shti190248. PubMed PMID: 31437950; PubMed Central PMCID: PMC6857180.
186. Jiang G, Yu Y, Kingsbury PR, Shah N. Augmenting Medical Device Evaluation Using a Reusable Unique Device Identifier Interoperability Solution Based on the OHDSI Common Data Model. *Stud Health Technol Inform.* 2019;264:1502-3. doi: 10.3233/shti190505. PubMed PMID: 31438202.
187. Viernes B, Lynch KE, South B, Coronado G, DuVall SL. Characterizing VA Users with the OMOP Common Data Model. *Stud Health Technol Inform.* 2019;264:1614-5. doi: 10.3233/shti190561. PubMed PMID: 31438258.
188. Belenkaya R, Gurley M, Dymshyts D, Araujo S, Williams A, Chen R, Reich C. Standardized Observational Cancer Research Using the OMOP CDM Oncology Module. *Stud Health Technol Inform.* 2019;264:1831-2. doi: 10.3233/shti190670. PubMed PMID: 31438365.
189. Shin SJ, You SC, Roh J, Park YR, Park RW. Genomic Common Data Model for Biomedical Data in Clinical Practice. *Stud Health Technol Inform.* 2019;264:1843-4. doi: 10.3233/shti190676. PubMed PMID: 31438371.
190. Meystre SM, Heider PM, Kim Y, Aruch DB, Britten CD. Automatic trial eligibility surveillance based on unstructured clinical data. *Int J Med Inform.* 2019;129:13-9. Epub 20190523. doi: 10.1016/j.ijmedinf.2019.05.018. PubMed PMID: 31445247; PubMed Central PMCID: PMC6717538.
191. Wang L, Voss EA, Weaver J, Hester L, Yuan Z, DeFalco F, Schuemie MJ, Ryan PB, Sun D, Freedman A, Alba M, Lind J, Meininger G, Berlin JA, Rosenthal N. Diabetic ketoacidosis in patients with type 2 diabetes treated with sodium glucose co-transporter 2 inhibitors versus other antihyperglycemic agents: An observational study of four US administrative claims databases. *Pharmacoepidemiol Drug Saf.* 2019;28(12):1620-8. Epub 20190827. doi: 10.1002/pds.4887. PubMed PMID: 31456304; PubMed Central PMCID: PMC6916409.
192. Kapsner LA, Kampf MO, Seuchter SA, Kamdje-Wabo G, Gradinger T, Ganslandt T, Mate S, Gruendner J, Kraska D, Prokosch HU. Moving Towards an EHR Data Quality Framework: The MIRACUM Approach. *Stud Health Technol Inform.* 2019;267:247-53. doi: 10.3233/shti190834. PubMed PMID: 31483279.
193. Haberson A, Rinner C, Schöberl A, Gall W. Feasibility of Mapping Austrian Health Claims Data to the OMOP Common Data Model. *J Med Syst.* 2019;43(10):314. Epub 20190907. doi: 10.1007/s10916-019-1436-9. PubMed PMID: 31494719; PubMed Central PMCID: PMC6732152.
194. Shang N, Liu C, Rasmussen LV, Ta CN, Carroll RJ, Benoit B, Lingren T, Dikilitas O, Mentch FD, Carrell DS, Wei WQ, Luo Y, Gainer VS, Kullo IJ, Pacheco JA, Hakonarson H, Walunas TL, Denny JC, Wiley K, Murphy SN, Hripcsak G, Weng C. Making work visible for electronic phenotype implementation: Lessons learned from the eMERGE network. *J Biomed Inform.* 2019;99:103293. Epub 20190919. doi: 10.1016/j.jbi.2019.103293. PubMed PMID: 31542521; PubMed Central PMCID: PMC6894517.
195. Guo GN, Jonnagaddala J, Farshid S, Huser V, Reich C, Liaw ST. Comparison of the cohort selection performance of Australian Medicines Terminology to Anatomical Therapeutic Chemical mappings. *J Am Med Inform Assoc.* 2019;26(11):1237-46. doi: 10.1093/jamia/ocz143. PubMed PMID: 31545380; PubMed Central PMCID: PMC7647230.
196. Wu P, Gifford A, Meng X, Li X, Campbell H, Varley T, Zhao J, Carroll R, Bastarache L, Denny JC, Theodoratou E, Wei WQ. Mapping ICD-10 and ICD-10-CM Codes to Phecodes: Workflow Development and Initial Evaluation. *JMIR Med Inform.* 2019;7(4):e14325. Epub 20191129. doi: 10.2196/14325. PubMed PMID: 31553307; PubMed Central PMCID: PMC6911227.
197. Gruendner J, Schwachhofer T, Sippl P, Wolf N, Erpenbeck M, Gulden C, Kapsner LA, Zierk J, Mate S, Stürzl M, Croner R, Prokosch HU, Todtenroth D. KETOS: Clinical decision support and machine learning as a service - A training and deployment platform based on Docker, OMOP-CDM, and FHIR Web Services. *PLoS One.* 2019;14(10):e0223010. Epub 20191003. doi: 10.1371/journal.pone.0223010. PubMed PMID: 31581246; PubMed Central PMCID: PMC6776354.
198. Bartlett VL, Dhruva SS, Shah ND, Ryan P, Ross JS. Feasibility of Using Real-World Data to Replicate Clinical Trial Evidence. *JAMA Netw Open.* 2019;2(10):e1912869. Epub 20191002. doi: 10.1001/jamanetworkopen.2019.12869. PubMed PMID: 31596493; PubMed Central PMCID: PMC6802419.
199. Glicksberg BS, Oskotsky B, Giangreco N, Thangaraj PM, Rudrapatna V, Datta D, Frazier R, Lee N, Larsen R, Tatonetti NP, Butte AJ. ROMOP: a light-weight R package for interfacing with OMOP-formatted electronic health record data. *JAMIA Open.* 2019;2(1):10-4. Epub 20190104. doi: 10.1093/jamiaopen/ooy059. PubMed PMID: 31633087; PubMed Central PMCID: PMC6800657.
200. Lynch KE, Deppen SA, DuVall SL, Viernes B, Cao A, Park D, Hanchrow E, Hewa K, Greaves P, Matheny ME. Incrementally Transforming Electronic Medical Records into the Observational Medical Outcomes Partnership Common Data Model: A Multidimensional Quality Assurance Approach. *Appl Clin Inform.* 2019;10(5):794-803. Epub 20191023. doi: 10.1055/s-0039-1697598. PubMed PMID: 31645076; PubMed Central PMCID: PMC6811349.
201. Suchard MA, Schuemie MJ, Krumholz HM, You SC, Chen R, Pratt N, Reich CG, Duke J, Madigan D, Hripcsak G, Ryan PB. Comprehensive comparative effectiveness and safety of first-line antihypertensive drug classes: a systematic, multinational, large-scale analysis. *Lancet.* 2019;394(10211):1816-26. Epub 20191024. doi: 10.1016/s0140-6736(19)32317-7. PubMed PMID: 31668726; PubMed Central PMCID: PMC6924620.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

202. Kwong M, Gardner HL, Dieterle N, Rentko V. Optimization of Electronic Medical Records for Data Mining Using a Common Data Model. *Top Companion Anim Med.* 2019;37:100364. Epub 20190926. doi: 10.1016/j.tcam.2019.100364. PubMed PMID: 31837755; PubMed Central PMCID: PMC7874511.
203. Chandran U, Reps J, Stang PE, Ryan PB. Inferring disease severity in rheumatoid arthritis using predictive modeling in administrative claims databases. *PLoS One.* 2019;14(12):e0226255. Epub 20191218. doi: 10.1371/journal.pone.0226255. PubMed PMID: 31851711; PubMed Central PMCID: PMC6919633.
204. Rasmussen LV, Brandt PS, Jiang G, Kiefer RC, Pacheco JA, Adekanlatu P, Ancker JS, Wang F, Xu Z, Pathak J, Luo Y. Considerations for Improving the Portability of Electronic Health Record-Based Phenotype Algorithms. *AMIA Annu Symp Proc.* 2019;2019:755-64. Epub 20200304. PubMed PMID: 32308871; PubMed Central PMCID: PMC7153055.
205. Burn E, Weaver J, Morales D, Prats-Urbe A, Delmestri A, Strauss VY, He Y, Robinson DE, Pinedo-Villanueva R, Kolovos S, Duarte-Salles T, Sproviero W, Yu D, Van Speybroeck M, Williams R, John LH, Hughes N, Sena AG, Costello R, Birlie B, Culliford D, O'Leary C, Morgan H, Burkard T, Prieto-Alhambra D, Ryan P. Opioid use, postoperative complications, and implant survival after unicompartmental versus total knee replacement: a population-based network study. *Lancet Rheumatol.* 2019;1(4):e229-e36. Epub 20191107. doi: 10.1016/s2665-9913(19)30075-x. PubMed PMID: 38229379.
206. Dobbins NJ, Spital CH, Black RA, Morrison JM, de Veer B, Zampino E, Harrington RD, Britt BD, Stephens KA, Wilcox AB, Tarczy-Hornoch P, Mooney SD. Leaf: an open-source, model-agnostic, data-driven web application for cohort discovery and translational biomedical research. *J Am Med Inform Assoc.* 2020;27(1):109-18. doi: 10.1093/jamia/oc2165. PubMed PMID: 31592524; PubMed Central PMCID: PMC6913227.
207. You SC, Jung S, Swerdel JN, Ryan PB, Schuemie MJ, Suchard MA, Lee S, Cho J, Hripscak G, Park RW, Park S. Comparison of First-Line Dual Combination Treatments in Hypertension: Real-World Evidence from Multinational Heterogeneous Cohorts. *Korean Circ J.* 2020;50(1):52-68. Epub 20190828. doi: 10.4070/kcj.2019.0173. PubMed PMID: 31642211; PubMed Central PMCID: PMC6923236.
208. Kumar P, Nestsiarovich A, Nelson SJ, Kerner B, Perkins DJ, Lambert CG. Imputation and characterization of uncoded self-harm in major mental illness using machine learning. *J Am Med Inform Assoc.* 2020;27(1):136-46. doi: 10.1093/jamia/oc2173. PubMed PMID: 31651956; PubMed Central PMCID: PMC7647246.
209. Tong J, Duan R, Li R, Scheuemie MJ, Moore JH, Chen Y. Robust-ODAL: Learning from heterogeneous health systems without sharing patient-level data. *Pac Symp Biocomput.* 2020;25:695-706. PubMed PMID: 31797639; PubMed Central PMCID: PMC6905508.
210. Ostroplets A, Reich C, Ryan P, Shang N, Hripscak G, Weng C. Adapting electronic health records-derived phenotypes to claims data: Lessons learned in using limited clinical data for phenotyping. *J Biomed Inform.* 2020;102:103363. Epub 20191219. doi: 10.1016/j.jbi.2019.103363. PubMed PMID: 31866433; PubMed Central PMCID: PMC7390483.
211. Kern DM, Cepeda MS, Defalco F, Etropolski M. Treatment patterns and sequences of pharmacotherapy for patients diagnosed with depression in the United States: 2014 through 2019. *BMC Psychiatry.* 2020;20(1):4. Epub 20200103. doi: 10.1186/s12888-019-2418-7. PubMed PMID: 31900133; PubMed Central PMCID: PMC6942399.
212. Wang Q, Reps JM, Kostka KF, Ryan PB, Zou Y, Voss EA, Rijnbeek PR, Chen R, Rao GA, Morgan Stewart H, Williams AE, Williams RD, Van Zandt M, Falconer T, Fernandez-Chas M, Vashisht R, Pfohl SR, Shah NH, Kasthurirathne SN, You SC, Jiang Q, Reich C, Zhou Y. Development and validation of a prognostic model predicting symptomatic hemorrhagic transformation in acute ischemic stroke at scale in the OHDSI network. *PLoS One.* 2020;15(1):e0226718. Epub 20200107. doi: 10.1371/journal.pone.0226718. PubMed PMID: 31910437; PubMed Central PMCID: PMC6946584.
213. Lamer A, Depas N, Doutreligne M, Parrot A, Verloop D, Defebvre MM, Ficheur G, Chazard E, Beuscart JB. Transforming French Electronic Health Records into the Observational Medical Outcome Partnership's Common Data Model: A Feasibility Study. *Appl Clin Inform.* 2020;11(1):13-22. Epub 20200108. doi: 10.1055/s-0039-3402754. PubMed PMID: 31914471; PubMed Central PMCID: PMC6949163.
214. Spotnitz ME, Natarajan K, Ryan PB, Westhoff CL. Relative Risk of Cervical Neoplasms Among Copper and Levonorgestrel-Releasing Intrauterine System Users. *Obstet Gynecol.* 2020;135(2):319-27. doi: 10.1097/aog.0000000000003656. PubMed PMID: 31923062; PubMed Central PMCID: PMC7012337.
215. Buglione M, Jereczek-Fossa BA, Bonù ML, Franceschini D, Fodor A, Zanetti IB, Gerardi MA, Borghetti P, Tomasini D, Di Muzio NG, Oneta O, Scorsetti M, Franzese C, Romanelli P, Catalano G, Dell'Oca I, Beltramo G, Ivaldi GB, Laudati A, Magrini SM, Antognoni P. Radiosurgery and fractionated stereotactic radiotherapy in oligometastatic/oligoproggressive non-small cell lung cancer patients: Results of a multi-institutional series of 198 patients treated with "curative" intent. *Lung Cancer.* 2020;141:1-8. Epub 20200103. doi: 10.1016/j.lungcan.2019.12.019. PubMed PMID: 31926440.
216. Brauer R, Wong ICK, Man KK, Pratt NL, Park RW, Cho SY, Li YJ, Iqbal U, Nguyen PA, Schuemie M. Application of a Common Data Model (CDM) to rank the paediatric user and prescription prevalence of 15 different drug classes in South Korea, Hong Kong, Taiwan, Japan and Australia: an observational, descriptive study. *BMJ Open.* 2020;10(1):e032426. Epub 20200113. doi: 10.1136/bmjopen-2019-032426. PubMed PMID: 31937652; PubMed Central PMCID: PMC7044847.
217. Swerdel JN, Reps JM, Fife D, Ryan PB. Developing Predictive Models to Determine Patients in End-of-Life Care in Administrative Datasets. *Drug Saf.* 2020;43(5):447-55. doi: 10.1007/s40264-020-00906-7. PubMed PMID: 31939079; PubMed Central PMCID: PMC7165142.
218. Tiwari P, Colborn KL, Smith DE, Xing F, Ghosh D, Rosenberg MA. Assessment of a Machine Learning Model Applied to Harmonized Electronic Health Record Data for the Prediction of Incident Atrial Fibrillation. *JAMA Netw Open.* 2020;3(1):e1919396. Epub 20200103. doi: 10.1001/jamanetworkopen.2019.19396. PubMed PMID: 31951272; PubMed Central PMCID: PMC6991266.
219. Candore G, Hedenmalm K, Slattery J, Cave A, Kurz X, Arlett P. Can We Rely on Results From IQVIA Medical Research Data UK Converted to the Observational Medical Outcome Partnership Common Data Model?: A Validation Study Based on Prescribing Codeine in Children. *Clin Pharmacol Ther.* 2020;107(4):915-25. Epub 20200302. doi: 10.1002/cpt.1785. PubMed PMID: 31956997; PubMed Central PMCID: PMC7158210.
220. Seo SI, You SC, Park CH, Kim TJ, Ko YS, Kim Y, Yoo JJ, Kim J, Shin WG. Comparative risk of Clostridium difficile infection between proton pump inhibitors and histamine-2 receptor antagonists: A 15-year hospital cohort study using a common data model. *J Gastroenterol Hepatol.* 2020;35(8):1325-30. Epub 20200129. doi: 10.1111/jgh.14983. PubMed PMID: 31970824.
221. Reps JM, Cepeda MS, Ryan PB. Wisdom of the CROUD: Development and validation of a patient-level prediction model for opioid use disorder using population-level claims data. *PLoS One.* 2020;15(2):e0228632. Epub 20200213. doi: 10.1371/journal.pone.0228632. PubMed PMID: 32053653; PubMed Central PMCID: PMC7017997.
222. Hripscak G, Suchard MA, Shea S, Chen R, You SC, Pratt N, Madigan D, Krumholz HM, Ryan PB, Schuemie MJ. Comparison of Cardiovascular and Safety Outcomes of Chlorthalidone vs Hydrochlorothiazide to Treat Hypertension. *JAMA Intern Med.* 2020;180(4):542-51. doi: 10.1001/jamainternmed.2019.7454. PubMed PMID: 32065600; PubMed Central PMCID: PMC7042845.
223. Thurin NH, Lassalle R, Schuemie M, Pénichon M, Gagne JJ, Rassen JA, Benichou J, Weill A, Blin P, Moore N, Droz-Perroteau C. Empirical assessment of case-based methods for drug safety alert identification in the French National Healthcare System database (SNDS): Methodology of the ALCAPONE project. *Pharmacoepidemiol Drug Saf.* 2020;29(9):993-1000. Epub 20200304. doi: 10.1002/pds.4983. PubMed PMID: 32133717.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

224. Chen R, Ryan P, Natarajan K, Falconer T, Crew KD, Reich CG, Vashisht R, Randhawa G, Shah NH, Hripcsak G. Treatment Patterns for Chronic Comorbid Conditions in Patients With Cancer Using a Large-Scale Observational Data Network. *JCO Clin Cancer Inform.* 2020;4:171-83. doi: 10.1200/cci.19.00107. PubMed PMID: 32134687; PubMed Central PMCID: PMC7113074.
225. Choi SA, Kim H, Kim S, Yoo S, Yi S, Jeon Y, Hwang H, Kim KJ. Analysis of antiseizure drug-related adverse reactions from the electronic health record using the common data model. *Epilepsia.* 2020;61(4):610-6. Epub 20200312. doi: 10.1111/epi.16472. PubMed PMID: 32162687.
226. Skjødt MK, Khalid S, Ernst M, Rubin KH, Martinez-Laguna D, Delmestri A, Javaid MK, Cooper C, Libanati C, Toth E, Abrahamson B, Prieto-Alhambra D. Secular trends in the initiation of therapy in secondary fracture prevention in Europe: a multi-national cohort study including data from Denmark, Catalonia, and the United Kingdom. *Osteoporos Int.* 2020;31(8):1535-44. Epub 20200317. doi: 10.1007/s00198-020-05358-4. PubMed PMID: 32185437; PubMed Central PMCID: PMC7360649.
227. Stephens KA, West, II, Hallgren KA, Mollis B, Ma K, Donovan DM, Stuvek B, Baldwin LM. Service utilization and chronic condition outcomes among primary care patients with substance use disorders and co-occurring chronic conditions. *J Subst Abuse Treat.* 2020;112s:49-55. doi: 10.1016/j.jsat.2020.02.008. PubMed PMID: 32220411; PubMed Central PMCID: PMC7274163.
228. Dixon BE, Wen C, French T, Williams JL, Duke JD, Grannis SJ. Extending an open-source tool to measure data quality: case report on Observational Health Data Science and Informatics (OHDSI). *BMJ Health Care Inform.* 2020;27(1). doi: 10.1136/bmjhci-2019-100054. PubMed PMID: 32229499; PubMed Central PMCID: PMC7254131.
229. Choi YI, Kim YJ, Chung JW, Kim KO, Kim H, Park RW, Park DK. Effect of Age on the Initiation of Biologic Agent Therapy in Patients With Inflammatory Bowel Disease: Korean Common Data Model Cohort Study. *JMIR Med Inform.* 2020;8(4):e15124. Epub 20200415. doi: 10.2196/15124. PubMed PMID: 32293578; PubMed Central PMCID: PMC7191339.
230. Lovestone S. The European medical information framework: A novel ecosystem for sharing healthcare data across Europe. *Learn Health Syst.* 2020;4(2):e10214. Epub 20191225. doi: 10.1002/lrh2.10214. PubMed PMID: 32313838; PubMed Central PMCID: PMC7156868.
231. Abrahamson B, Ernst MT, Smith CD, Nybo M, Rubin KH, Prieto-Alhambra D, Hermann AP. The association between renal function and BMD response to bisphosphonate treatment: Real-world cohort study using linked national registers. *Bone.* 2020;137:115371. Epub 20200422. doi: 10.1016/j.bone.2020.115371. PubMed PMID: 32334104.
232. Weng C, Shah NH, Hripcsak G. Deep phenotyping: Embracing complexity and temporality-Towards scalability, portability, and interoperability. *J Biomed Inform.* 2020;105:103433. Epub 20200423. doi: 10.1016/j.jbi.2020.103433. PubMed PMID: 32335224; PubMed Central PMCID: PMC7179504.
233. Yuan Z, DeFalco F, Wang L, Hester L, Weaver J, Swerdel JN, Freedman A, Ryan P, Schuemie M, Qiu R, Yee J, Meininger G, Berlin JA, Rosenthal N. Acute pancreatitis risk in type 2 diabetes patients treated with canagliflozin versus other antihyperglycemic agents: an observational claims database study. *Curr Med Res Opin.* 2020;36(7):1117-24. Epub 20200514. doi: 10.1080/03007995.2020.1761312. PubMed PMID: 32338068.
234. Kashyap M, Seneviratne M, Banda JM, Falconer T, Ryu B, Yoo S, Hripcsak G, Shah NH. Development and validation of phenotype classifiers across multiple sites in the observational health data sciences and informatics network. *J Am Med Inform Assoc.* 2020;27(6):877-83. doi: 10.1093/jamia/ocaa032. PubMed PMID: 32374408; PubMed Central PMCID: PMC7309227.
235. Reys JM, Williams RD, You SC, Falconer T, Minty E, Callahan A, Ryan PB, Park RW, Lim HS, Rijnbeek P. Feasibility and evaluation of a large-scale external validation approach for patient-level prediction in an international data network: validation of models predicting stroke in female patients newly diagnosed with atrial fibrillation. *BMC Med Res Methodol.* 2020;20(1):102. Epub 20200506. doi: 10.1186/s12874-020-00991-3. PubMed PMID: 32375693; PubMed Central PMCID: PMC7201646.
236. Chandler RE. Nintedanib and ischemic colitis: Signal assessment with the integrated use of two types of real-world evidence, spontaneous reports of suspected adverse drug reactions, and observational data from large health-care databases. *Pharmacoepidemiol Drug Saf.* 2020;29(8):951-7. Epub 20200512. doi: 10.1002/pds.5022. PubMed PMID: 32399991; PubMed Central PMCID: PMC7496543.
237. Averitt AJ, Weng C, Ryan P, Perotte A. Translating evidence into practice: eligibility criteria fail to eliminate clinically significant differences between real-world and study populations. *NPJ Digit Med.* 2020;3:67. Epub 20200511. doi: 10.1038/s41746-020-0277-8. PubMed PMID: 32411828; PubMed Central PMCID: PMC7214444.
238. Heintjes EM, Bezemer ID, Prieto-Alhambra D, Smits E, Booth HP, Dedman D, He Y, Hoti F, Vehkala M, de Vogel S, Robinson NJ, Appenteng K, Penning-van Beest FJA. Evaluating the Effectiveness of an Additional Risk Minimization Measure to Reduce the Risk of Prescribing Mirabegron to Patients with Severe Uncontrolled Hypertension in Four European Countries. *Clin Epidemiol.* 2020;12:423-33. Epub 20200501. doi: 10.2147/clep.S242065. PubMed PMID: 32431551; PubMed Central PMCID: PMC7200224.
239. Alnofal FA, Alrwisan AA, Alshammari TM. Real-world data in Saudi Arabia: Current situation and challenges for regulatory decision-making. *Pharmacoepidemiol Drug Saf.* 2020;29(10):1303-6. Epub 20200527. doi: 10.1002/pds.5025. PubMed PMID: 32458499.
240. Ji H, Kim S, Yi S, Hwang H, Kim JW, Yoo S. Converting clinical document architecture documents to the common data model for incorporating health information exchange data in observational health studies: CDA to CDM. *J Biomed Inform.* 2020;107:103459. Epub 20200526. doi: 10.1016/j.jbi.2020.103459. PubMed PMID: 32470694.
241. Kim H, Yoo S, Jeon Y, Yi S, Kim S, Choi SA, Hwang H, Kim KJ. Characterization of Anti-seizure Medication Treatment Pathways in Pediatric Epilepsy Using the Electronic Health Record-Based Common Data Model. *Front Neurol.* 2020;11:409. Epub 20200512. doi: 10.3389/fneur.2020.00409. PubMed PMID: 32477256; PubMed Central PMCID: PMC7235379.
242. Davidson L, Boland MR. Comparative Analysis and Evaluation of State-of-the-Art Medication Mapping Tools to Transform a Local Medication Terminology to RxNorm. *AMIA Jt Summits Transl Sci Proc.* 2020;2020:126-35. Epub 20200530. PubMed PMID: 32477631; PubMed Central PMCID: PMC7233099.
243. Michael CL, Sholle ET, Wulff RT, Roboz GJ, Campion TR, Jr. Mapping Local Biospecimen Records to the OMOP Common Data Model. *AMIA Jt Summits Transl Sci Proc.* 2020;2020:422-9. Epub 20200530. PubMed PMID: 32477663; PubMed Central PMCID: PMC7233045.
244. Yu Y, Ruddy KJ, Wen A, Zong N, Tsuji S, Chen J, Shah ND, Jiang G. Integrating Electronic Health Record Data into the ADEpedia-on-OHDSI Platform for Improved Signal Detection: A Case Study of Immune-related Adverse Events. *AMIA Jt Summits Transl Sci Proc.* 2020;2020:710-9. Epub 20200530. PubMed PMID: 32477694; PubMed Central PMCID: PMC7233056.
245. Callahan A, Shah NH, Chen JH. Research and Reporting Considerations for Observational Studies Using Electronic Health Record Data. *Ann Intern Med.* 2020;172(11 Suppl):S79-s84. doi: 10.7326/m19-0873. PubMed PMID: 32479175; PubMed Central PMCID: PMC7413106.
246. de Lusignan S, Jones N, Dorward J, Byford R, Liyanage H, Briggs J, Ferreira F, Akinyemi O, Amirhalingam G, Bates C, Lopez Bernal J, Dabrera G, Eavis A, Elliot AJ, Feher M, Krajenbrink E, Hoang U, Howsam G, Leach J, Okusi C, Nicholson B, Nieri P, Sherlock J, Smith G, Thomas M, Thomas N, Tripathy M, Victor W, Williams J, Wood I, Zambon M, Parry J, O'Hanlon S, Joy M, Butler C, Marshall M, Hobbs FDR. The Oxford Royal College of General Practitioners Clinical Informatics Digital Hub: Protocol to Develop Extended COVID-19 Surveillance and Trial Platforms. *JMIR Public Health Surveill.* 2020;6(3):e19773. Epub 20200702. doi: 10.2196/19773. PubMed PMID: 32484782; PubMed Central PMCID: PMC7333793.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	119	124	108	167

247. Unberath P, Prokosch HU, Gründner J, Erpenbeck M, Maier C, Christoph J. EHR-Independent Predictive Decision Support Architecture Based on OMOP. *Appl Clin Inform.* 2020;11(3):399-404. Epub 20200603. doi: 10.1055/s-0040-1710393. PubMed PMID: 32492716; PubMed Central PMCID: PMC7269719.
248. Weinstein RB, Ryan PB, Berlin JA, Schuemie MJ, Swerdel J, Fife D. Channeling Bias in the Analysis of Risk of Myocardial Infarction, Stroke, Gastrointestinal Bleeding, and Acute Renal Failure with the Use of Paracetamol Compared with Ibuprofen. *Drug Saf.* 2020;43(9):927-42. doi: 10.1007/s40264-020-00950-3. PubMed PMID: 32500272; PubMed Central PMCID: PMC7434801.
249. Thurin NH, Lassalle R, Schuemie M, Pénichon M, Gagne JJ, Rassen JA, Benichou J, Weill A, Blin P, Moore N, Droz-Perroteau C. Empirical assessment of case-based methods for identification of drugs associated with upper gastrointestinal bleeding in the French National Healthcare System database (SNDS). *Pharmacoepidemiol Drug Saf.* 2020;29(8):890-903. Epub 20200610. doi: 10.1002/pds.5038. PubMed PMID: 32524701.
250. Yu Y, Ruddy K, Mansfield A, Zong N, Wen A, Tsuji S, Huang M, Liu H, Shah N, Jiang G. Detecting and Filtering Immune-Related Adverse Events Signal Based on Text Mining and Observational Health Data Sciences and Informatics Common Data Model: Framework Development Study. *JMIR Med Inform.* 2020;8(6):e17353. Epub 20200612. doi: 10.2196/17353. PubMed PMID: 32530430; PubMed Central PMCID: PMC7320306.
251. Tian Y, Chen W, Zhou T, Li J, Ding K, Li J. Establishment and evaluation of a multicenter collaborative prediction model construction framework supporting model generalization and continuous improvement: A pilot study. *Int J Med Inform.* 2020;141:104173. Epub 20200530. doi: 10.1016/j.ijmedinf.2020.104173. PubMed PMID: 32531725.
252. Fischer P, Stöhr MR, Gall H, Michel-Backofen A, Majeed RW. Data Integration into OMOP CDM for Heterogeneous Clinical Data Collections via HL7 FHIR Bundles and XSLT. *Stud Health Technol Inform.* 2020;270:138-42. doi: 10.3233/shti200138. PubMed PMID: 32570362.
253. Reinecke I, Gulden C, Kümmel M, Nassirian A, Blasini R, Sedlmayr M. Design for a Modular Clinical Trial Recruitment Support System Based on FHIR and OMOP. *Stud Health Technol Inform.* 2020;270:158-62. doi: 10.3233/shti200142. PubMed PMID: 32570366.
254. Gruhl M, Reinecke I, Sedlmayr M. Specification and Distribution of Vocabularies Among Consortial Partners. *Stud Health Technol Inform.* 2020;270:1393-4. doi: 10.3233/shti200458. PubMed PMID: 32570675.
255. Duan R, Luo C, Schuemie MJ, Tong J, Liang CJ, Chang HH, Boland MR, Bian J, Xu H, Holmes JH, Forrest CB, Morton SC, Berlin JA, Moore JH, Mahoney KB, Chen Y. Learning from local to global: An efficient distributed algorithm for modeling time-to-event data. *J Am Med Inform Assoc.* 2020;27(7):1028-36. doi: 10.1093/jamia/ocaa044. PubMed PMID: 32626900; PubMed Central PMCID: PMC7647322.
256. Kim Y, Tian Y, Yang J, Huser V, Jin P, Lambert CG, Park H, You SC, Park RW, Rijnbeek PR, Van Zandt M, Reich C, Vashisht R, Wu Y, Duke J, Hripcsak G, Madigan D, Shah NH, Ryan PB, Schuemie MJ, Suchard MA. Comparative safety and effectiveness of alendronate versus raloxifene in women with osteoporosis. *Sci Rep.* 2020;10(1):11115. Epub 20200706. doi: 10.1038/s41598-020-68037-8. PubMed PMID: 32632237; PubMed Central PMCID: PMC7338498.
257. Coma Redon E, Mora N, Prats-Urbe A, Fina Avilés F, Prieto-Alhambra D, Medina M. Excess cases of influenza and the coronavirus epidemic in Catalonia: a time-series analysis of primary-care electronic medical records covering over 6 million people. *BMJ Open.* 2020;10(7):e039369. Epub 20200729. doi: 10.1136/bmjopen-2020-039369. PubMed PMID: 32727740; PubMed Central PMCID: PMC7431772.
258. Averitt AJ, Vanitchanan N, Ranganath R, Perotte AJ. The Counterfactual χ -GAN: Finding comparable cohorts in observational health data. *J Biomed Inform.* 2020;109:103515. Epub 20200807. doi: 10.1016/j.jbi.2020.103515. PubMed PMID: 32771540.
259. Kern DM, Cepeda MS. Treatment patterns and comorbid burden of patients newly diagnosed with multiple sclerosis in the United States. *BMC Neurol.* 2020;20(1):296. Epub 20200811. doi: 10.1186/s12883-020-01882-2. PubMed PMID: 32781983; PubMed Central PMCID: PMC7418327.
260. Syed S, Baghal A, Prior F, Zozus M, Al-Shukri S, Syeda HB, Garza M, Begum S, Gates K, Syed M, Sexton KW. Toolkit to Compute Time-Based Elixhauser Comorbidity Indices and Extension to Common Data Models. *Healthc Inform Res.* 2020;26(3):193-200. Epub 20200731. doi: 10.4258/hir.2020.26.3.193. PubMed PMID: 32819037; PubMed Central PMCID: PMC7438698.
261. Schuemie MJ, Ryan PB, Pratt N, Chen R, You SC, Krumholz HM, Madigan D, Hripcsak G, Suchard MA. Large-scale evidence generation and evaluation across a network of databases (LEGEND): assessing validity using hypertension as a case study. *J Am Med Inform Assoc.* 2020;27(8):1268-77. doi: 10.1093/jamia/ocaa124. PubMed PMID: 32827027; PubMed Central PMCID: PMC7481033.
262. Brat GA, Weber GM, Gehlenborg N, Avillach P, Palmer NP, Chiovato L, Cimino J, Waitman LR, Omenn GS, Malovini A, Moore JH, Beaulieu-Jones BK, Tibollo V, Murphy SN, Yi SL, Keller MS, Bellazzi R, Hanauer DA, Serret-Larmande A, Gutierrez-Sacristan A, Holmes JJ, Bell DS, Mandl KD, Follett RW, Klann JG, Murad DA, Scudeller L, Bucalo M, Kirchoff K, Craig J, Obeid J, Jouhet V, Griffier R, Cossin S, Moal B, Patel LP, Bellasi A, Prokosch HU, Kraska D, Sliz P, Tan ALM, Ngiam KY, Zambelli A, Mowery DL, Schiver E, Devkota B, Bradford RL, Daniar M, Daniel C, Benoit V, Bey R, Paris N, Serre P, Orlova N, Dubiel J, Hilka M, Jannot AS, Breant S, Leblanc J, Griffon N, Burgun A, Bernaux M, Sandrin A, Salamanca E, Cormont S, Ganslandt T, Gradinger T, Champ J, Boeker M, Martel P, Esteve L, Gramfort A, Grisel O, Leprovost D, Moreau T, Varoquaux G, Vie JJ, Wassermann D, Mensch A, Caucheteux C, Haverkamp C, Lemaitre G, Bosari S, Krantz ID, South A, Cai T, Kohane IS. International electronic health record-derived COVID-19 clinical course profiles: the 4CE consortium. *NPJ Digit Med.* 2020;3:109. Epub 20200819. doi: 10.1038/s41746-020-00308-0. PubMed PMID: 32864472; PubMed Central PMCID: PMC7438496.
263. Lane JCE, Weaver J, Kostka K, Duarte-Salles T, Abrahao MTF, Alghoul H, Alser O, Alshammari TM, Biedermann P, Banda JM, Burn E, Casajust P, Conover MM, Culhane AC, Davydov A, DuVall SL, Dymshyts D, Fernandez-Bertolin S, Fišter K, Hardin J, Hester L, Hripcsak G, Kaas-Hansen BS, Kent S, Khosla S, Kolovos S, Lambert CG, van der Lei J, Lynch KE, Makadia R, Margulis AV, Matheny ME, Mehta P, Morales DR, Morgan-Stewart H, Mosseveld M, Newby D, Nyberg F, Ostropolets A, Park RW, Prats-Urbe A, Rao GA, Reich C, Rejs J, Rijnbeek P, Sathappan SMK, Schuemie M, Seager S, Sena AG, Shoaibi A, Spotnitz M, Suchard MA, Torre CO, Vizcaya D, Wen H, de Wilde M, Xie J, You SC, Zhang L, Zhuk O, Ryan P, Prieto-Alhambra D. Risk of hydroxychloroquine alone and in combination with azithromycin in the treatment of rheumatoid arthritis: a multinational, retrospective study. *Lancet Rheumatol.* 2020;2(11):e698-e711. Epub 20200821. doi: 10.1016/s2665-9913(20)30276-9. PubMed PMID: 32864627; PubMed Central PMCID: PMC7442425.
264. Schuemie MJ, Ryan PB, Pratt N, Chen R, You SC, Krumholz HM, Madigan D, Hripcsak G, Suchard MA. Principles of Large-scale Evidence Generation and Evaluation across a Network of Databases (LEGEND). *J Am Med Inform Assoc.* 2020;27(8):1331-7. doi: 10.1093/jamia/ocaa103. PubMed PMID: 32909033; PubMed Central PMCID: PMC7481029.
265. Lee SM, Kim K, Yoon J, Park SK, Moon S, Lee SE, Oh J, Yoo S, Kim KI, Yoon HJ, Lee HY. Association between Use of Hydrochlorothiazide and Nonmelanoma Skin Cancer: Common Data Model Cohort Study in Asian Population. *J Clin Med.* 2020;9(9). Epub 20200909. doi: 10.3390/jcm9092910. PubMed PMID: 32916988; PubMed Central PMCID: PMC7563303.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

266. Su CC, Chia-Cheng Lai E, Kao Yang YH, Man KKC, Kubota K, Stang P, Schuemie M, Ryan P, Hardy C, Zhang Y, Kimura S, Kamijima Y, Wong ICK, Setoguchi S. Incidence, prevalence and prescription patterns of antipsychotic medications use in Asia and US: A cross-nation comparison with common data model. *J Psychiatr Res.* 2020;131:77-84. Epub 20200827. doi: 10.1016/j.jpsychires.2020.08.025. PubMed PMID: 32947205.
267. Mandair D, Tiwari P, Simon S, Colborn KL, Rosenberg MA. Prediction of incident myocardial infarction using machine learning applied to harmonized electronic health record data. *BMC Med Inform Decis Mak.* 2020;20(1):252. Epub 20201002. doi: 10.1186/s12911-020-01268-x. PubMed PMID: 33008368; PubMed Central PMCID: PMC7532582.
268. Fishbein HA, Birch RJ, Mathew SM, Sawyer HL, Pulver G, Poling J, Kaelber D, Mardon R, Johnson MC, Pace W, Umbel KD, Zhang X, Siegel KR, Imperatore G, Shrestha S, Proia K, Cheng Y, McKeever Bullard K, Gregg EW, Rolka D, Pavkov ME. The Longitudinal Epidemiologic Assessment of Diabetes Risk (LEADR): Unique 1.4 M patient Electronic Health Record cohort. *Healthc (Amst).* 2020;8(4):100458. Epub 20201001. doi: 10.1016/j.hjdsi.2020.100458. PubMed PMID: 33011645.
269. Alser O, Craig RS, Lane JCE, Prats-Uribe A, Robinson DE, Rees JL, Prieto-Alhambra D, Furniss D. Serious complications and risk of re-operation after Dupuytren's disease surgery: a population-based cohort study of 121,488 patients in England. *Sci Rep.* 2020;10(1):16520. Epub 20201005. doi: 10.1038/s41598-020-73595-y. PubMed PMID: 33020582; PubMed Central PMCID: PMC7536429.
270. Liu S, Wang Y, Wen A, Wang L, Hong N, Shen F, Bedrick S, Hersh W, Liu H. Implementation of a Cohort Retrieval System for Clinical Data Repositories Using the Observational Medical Outcomes Partnership Common Data Model: Proof-of-Concept System Validation. *JMIR Med Inform.* 2020;8(10):e17376. Epub 20201006. doi: 10.2196/17376. PubMed PMID: 33021486; PubMed Central PMCID: PMC7576539.
271. Lee DY, Cho J, You SC, Park RW, Kim CS, Lee EY, Aizenstein H, Andreescu C, Karim H, Hong CH, Rho HW, Park B, Son SJ. Risk of Mortality in Elderly Coronavirus Disease 2019 Patients With Mental Health Disorders: A Nationwide Retrospective Study in South Korea. *Am J Geriatr Psychiatry.* 2020;28(12):1308-16. Epub 20200928. doi: 10.1016/j.jagp.2020.09.016. PubMed PMID: 33023798; PubMed Central PMCID: PMC7521355.
272. Burn E, You SC, Sena AG, Kostka K, Abedtash H, Abrahão MTF, Albergia A, Alghoul H, Alser O, Alshammari TM, Aragon M, Areia C, Banda JM, Cho J, Culhane AC, Davydov A, DeFalco FJ, Duarte-Salles T, DuVall S, Falconer T, Fernandez-Bertolin S, Gao W, Golozar A, Hardin J, Hripcsak G, Huser V, Jeon H, Jing Y, Jung CY, Kaas-Hansen BS, Kaduk D, Kent S, Kim Y, Kolovos S, Lane JCE, Lee H, Lynch KE, Makadia R, Matheny ME, Mehta PP, Morales DR, Natarajan K, Nyberg F, Ostropolets A, Park RW, Park J, Posada JD, Prats-Uribe A, Rao G, Reich C, Rho Y, Rijnbeek P, Schilling LM, Schuemie M, Shah NH, Shoaibi A, Song S, Spotnitz M, Suchard MA, Swerdel JN, Vizcaya D, Volpe S, Wen H, Williams AE, Yimer BB, Zhang L, Zhuk O, Prieto-Alhambra D, Ryan P. Deep phenotyping of 34,128 adult patients hospitalised with COVID-19 in an international network study. *Nat Commun.* 2020;11(1):5009. Epub 20201006. doi: 10.1038/s41467-020-18849-z. PubMed PMID: 33024121; PubMed Central PMCID: PMC7538555.
273. Cho S, Sin M, Tsapepas D, Dale LA, Husain SA, Mohan S, Natarajan K. Content Coverage Evaluation of the OMOP Vocabulary on the Transplant Domain Focusing on Concepts Relevant for Kidney Transplant Outcomes Analysis. *Appl Clin Inform.* 2020;11(4):650-8. Epub 20201007. doi: 10.1055/s-0040-1716528. PubMed PMID: 33027834; PubMed Central PMCID: PMC7557323.
274. Brandt PS, Kiefer RC, Pacheco JA, Adekanattu P, Sholle ET, Ahmad FS, Xu J, Xu Z, Ancker JS, Wang F, Luo Y, Jiang G, Pathak J, Rasmussen LV. Toward cross-platform electronic health record-driven phenotyping using Clinical Quality Language. *Learn Health Syst.* 2020;4(4):e10233. Epub 20200625. doi: 10.1002/lrh2.10233. PubMed PMID: 33083538; PubMed Central PMCID: PMC7556419.
275. You SC, Rho Y, Bickdeli B, Kim J, Siapos A, Weaver J, Londhe A, Cho J, Park J, Schuemie M, Suchard MA, Madigan D, Hripcsak G, Gupta A, Reich CG, Ryan PB, Park RW, Krumholz HM. Association of Ticagrelor vs Clopidogrel With Net Adverse Clinical Events in Patients With Acute Coronary Syndrome Undergoing Percutaneous Coronary Intervention. *Jama.* 2020;324(16):1640-50. doi: 10.1001/jama.2020.16167. PubMed PMID: 33107944; PubMed Central PMCID: PMC7592033.
276. Cho J, You SC, Lee S, Park D, Park B, Hripcsak G, Park RW. Application of Epidemiological Geographic Information System: An Open-Source Spatial Analysis Tool Based on the OMOP Common Data Model. *Int J Environ Res Public Health.* 2020;17(21). Epub 20201026. doi: 10.3390/ijerph17217824. PubMed PMID: 33114631; PubMed Central PMCID: PMC7663469.
277. Jeon S, Seo J, Kim S, Lee J, Kim JH, Sohn JW, Moon J, Joo HJ. Proposal and Assessment of a De-Identification Strategy to Enhance Anonymity of the Observational Medical Outcomes Partnership Common Data Model (OMOP-CDM) in a Public Cloud-Computing Environment: Anonymization of Medical Data Using Privacy Models. *J Med Internet Res.* 2020;22(11):e19597. Epub 20201126. doi: 10.2196/19597. PubMed PMID: 33177037; PubMed Central PMCID: PMC7728527.
278. Ryu B, Yoon E, Kim S, Lee S, Baek H, Yi S, Na HY, Kim JW, Baek RM, Hwang H, Yoo S. Transformation of Pathology Reports Into the Common Data Model With Oncology Module: Use Case for Colon Cancer. *J Med Internet Res.* 2020;22(12):e18526. Epub 20201209. doi: 10.2196/18526. PubMed PMID: 33295294; PubMed Central PMCID: PMC7758167.
279. Jin S, Kostka K, Posada JD, Kim Y, Seo SI, Lee DY, Shah NH, Roh S, Lim YH, Chae SG, Jin U, Son SJ, Reich C, Rijnbeek PR, Park RW, You SC. Prediction of Major Depressive Disorder Following Beta-Blocker Therapy in Patients with Cardiovascular Diseases. *J Pers Med.* 2020;10(4). Epub 20201218. doi: 10.3390/jpm10040288. PubMed PMID: 33352870; PubMed Central PMCID: PMC7766565.
280. Schuemie MJ, Cepeda MS, Suchard MA, Yang J, Tian Y, Schuler A, Ryan PB, Madigan D, Hripcsak G. How Confident Are We about Observational Findings in Healthcare: A Benchmark Study. *Harv Data Sci Rev.* 2020;2(1). Epub 20200131. doi: 10.1162/99608f92.147cc28e. PubMed PMID: 33367288; PubMed Central PMCID: PMC7755157.
281. Bompelli A, Li J, Xu Y, Wang N, Wang Y, Adam T, He Z, Zhang R. Deep Learning Approach to Parse Eligibility Criteria in Dietary Supplements Clinical Trials Following OMOP Common Data Model. *AMIA Annu Symp Proc.* 2020;2020:243-52. Epub 20210125. PubMed PMID: 33936396; PubMed Central PMCID: PMC8075443.
282. Ostropolets A, Reich C, Ryan P, Weng C, Molinaro A, DeFalco F, Jonnagaddala J, Liaw ST, Jeon H, Park RW, Spotnitz ME, Natarajan K, Argyriou G, Kostka K, Miller R, Williams A, Minty E, Posada J, Hripcsak G. Characterizing database granularity using SNOMED-CT hierarchy. *AMIA Annu Symp Proc.* 2020;2020:983-92. Epub 20210125. PubMed PMID: 33936474; PubMed Central PMCID: PMC8075504.
283. Zuo X, Li J, Zhao B, Zhou Y, Dong X, Duke J, Natarajan K, Hripcsak G, Shah N, Banda JM, Reeves R, Miller T, Xu H. Normalizing Clinical Document Titles to LOINC Document Ontology: an Initial Study. *AMIA Annu Symp Proc.* 2020;2020:1441-50. Epub 20210125. PubMed PMID: 33936520; PubMed Central PMCID: PMC8075502.
284. Harris DR. Leveraging Differential Privacy in Geospatial Analyses of Standardized Healthcare Data. *Proc IEEE Int Conf Big Data.* 2020;2020:3119-22. doi: 10.1109/big-data50022.2020.9378390. PubMed PMID: 35253022; PubMed Central PMCID: PMC8896738.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	119	124	108	167

OHDSI PUBLICATIONS

285. Blacketer C, Voss EA, DeFalco F, Hughes N, Schuemie MJ, Moinat M, Rijnbeek PR. Using the Data Quality Dashboard to Improve the EHDSI Network. *Applied Sciences* [Internet]. 2021; 11(24).
286. Hockett CW, Praveen PA, Ong TC, Amutha A, Isom SP, Jensen ET, D'Agostino RB, Jr., Hamman RF, Mayer-Davis EJ, Lawrence JM, Pihoker C, Kahn MG, Mohan V, Tandon N, Dabelea D. Clinical profile at diagnosis with youth-onset type 1 and type 2 diabetes in two pediatric diabetes registries: SEARCH (United States) and YDR (India). *Pediatr Diabetes*. 2021;22(1):22-30. Epub 20200129. doi: 10.1111/pedi.12981. PubMed PMID: 31953884; PubMed Central PMCID: PMC7785282.
287. Amutha A, Praveen PA, Hockett CW, Ong TC, Jensen ET, Isom SP, D'Agostino RB, Hamman RF, Mayer-Davis EJ, Wadwa RP, Lawrence JM, Pihoker C, Kahn MG, Dabelea D, Tandon N, Mohan V. Treatment regimens and glycosylated hemoglobin levels in youth with Type 1 and Type 2 diabetes: Data from SEARCH (United States) and YDR (India) registries. *Pediatr Diabetes*. 2021;22(1):31-9. Epub 20200324. doi: 10.1111/pedi.13004. PubMed PMID: 32134536; PubMed Central PMCID: PMC7744104.
288. Jensen ET, Dabelea DA, Praveen PA, Amutha A, Hockett CW, Isom SP, Ong TC, Mohan V, D'Agostino R, Jr., Kahn MG, Hamman RF, Wadwa P, Dolan L, Lawrence JM, Madhu SV, Chhokar R, Goel K, Tandon N, Mayer-Davis E. Comparison of the incidence of diabetes in United States and Indian youth: An international harmonization of youth diabetes registries. *Pediatr Diabetes*. 2021;22(1):8-14. Epub 20200406. doi: 10.1111/pedi.13009. PubMed PMID: 32196874; PubMed Central PMCID: PMC7748376.
289. Kim HI, Yoon JY, Kwak MS, Cha JM. Real-World Use of Colonoscopy in an Older Population: A Nationwide Standard Cohort Study Using a Common Data Model. *Dig Dis Sci*. 2021;66(7):2227-34. Epub 20200720. doi: 10.1007/s10620-020-06494-x. PubMed PMID: 32691386.
290. Haendel MA, Chute CG, Bennett TD, Eichmann DA, Guinney J, Kibbe WA, Payne PRO, Pfaff ER, Robinson PN, Saltz JH, Spratt H, Suver C, Wilbanks J, Wilcox AB, Williams AE, Wu C, Blacketer C, Bradford RL, Cimino JJ, Clark M, Colmenares EW, Francis PA, Gabriel D, Graves A, Hemadri R, Hong SS, Hripscak G, Jiao D, Klann JG, Kostka K, Lee AM, Lehmann HP, Lingrey L, Miller RT, Morris M, Murphy SN, Natarajan K, Palchuk MB, Sheikh U, Solbrig H, Visweswaran S, Walden A, Walters KM, Weber GM, Zhang XT, Zhu RL, Amor B, Girvin AT, Manna A, Qureshi N, Kurilla MG, Michael SG, Portilla LM, Rutter JL, Austin CP, Gersing KR. The National COVID Cohort Collaborative (N3C): Rationale, design, infrastructure, and deployment. *J Am Med Inform Assoc*. 2021;28(3):427-43. doi: 10.1093/jamia/ocaa196. PubMed PMID: 32805036; PubMed Central PMCID: PMC7454687.
291. Fife D, Blacketer C, Knight RK, Weaver J. Stroke Risk Among Elderly Users of Haloperidol and Typical Antipsychotics Versus Atypical Antipsychotics: A Real-World Study From a US Health Insurance Claims Database. *Am J Geriatr Psychiatry*. 2021;29(5):499-510. Epub 20200928. doi: 10.1016/j.jagp.2020.09.017. PubMed PMID: 33097389.
292. Thurin NH, Lassalle R, Schuemie M, Pénichon M, Gagne JJ, Rassen JA, Benichou J, Weill A, Blin P, Moore N, Droz-Perroteau C. Empirical assessment of case-based methods for identification of drugs associated with acute liver injury in the French National Healthcare System database (SNDS). *Pharmacoepidemiol Drug Saf*. 2021;30(3):320-33. Epub 20201119. doi: 10.1002/pds.5161. PubMed PMID: 33099844.
293. Kim C, You SC, Reys JM, Cheong JY, Park RW. Machine-learning model to predict the cause of death using a stacking ensemble method for observational data. *J Am Med Inform Assoc*. 2021;28(6):1098-107. doi: 10.1093/jamia/ocaa277. PubMed PMID: 33211841; PubMed Central PMCID: PMC8200274.
294. Kim JH, Ta CN, Liu C, Sung C, Butler AM, Stewart LA, Ena L, Rogers JR, Lee J, Ostropelets A, Ryan PB, Liu H, Lee SM, Elkind MSV, Weng C. Towards clinical data-driven eligibility criteria optimization for interventional COVID-19 clinical trials. *J Am Med Inform Assoc*. 2021;28(1):14-22. doi: 10.1093/jamia/ocaa276. PubMed PMID: 33260201; PubMed Central PMCID: PMC7798960.
295. Kent S, Burn E, Dawoud D, Jonsson P, Østby JT, Hughes N, Rijnbeek P, Bouvy JC. Common Problems, Common Data Model Solutions: Evidence Generation for Health Technology Assessment. *Pharmacoeconomics*. 2021;39(3):275-85. Epub 20201218. doi: 10.1007/s40273-020-00981-9. PubMed PMID: 33336320; PubMed Central PMCID: PMC7746423.
296. Morales DR, Conover MM, You SC, Pratt N, Kostka K, Duarte-Salles T, Fernández-Bertolin S, Aragón M, DuVall SL, Lynch K, Falconer T, van Bochove K, Sung C, Matheny ME, Lambert CG, Nyberg F, Alshammari TM, Williams AE, Park RW, Weaver J, Sena AG, Schuemie MJ, Rijnbeek PR, Williams RD, Lane JCE, Prats-Urbe A, Zhang L, Areia C, Krumholz HM, Prieto-Alhambra D, Ryan PB, Hripscak G, Suchard MA. Renin-angiotensin system blockers and susceptibility to COVID-19: an international, open science, cohort analysis. *Lancet Digit Health*. 2021;3(2):e98-e114. Epub 20201217. doi: 10.1016/s2589-7500(20)30289-2. PubMed PMID: 33342753; PubMed Central PMCID: PMC7834915.
297. Lane JCE, Weaver J, Kostka K, Duarte-Salles T, Abrahao MTF, Alghoul H, Alser O, Alshammari TM, Areia C, Biedermann P, Banda JM, Burn E, Casajust P, Fister K, Hardin J, Hester L, Hripscak G, Kaas-Hansen BS, Khosla S, Kolovos S, Lynch KE, Makadia R, Mehta PP, Morales DR, Morgan-Stewart H, Mosseveld M, Newby D, Nyberg F, Ostropelets A, Woong Park R, Prats-Urbe A, Rao GA, Reich C, Rijnbeek P, Sena AG, Shoaibi A, Spotnitz M, Subbian V, Suchard MA, Vizcaya D, Wen H, Wilde M, Xie J, You SC, Zhang L, Lovestone S, Ryan P, Prieto-Alhambra D. Risk of depression, suicide and psychosis with hydroxychloroquine treatment for rheumatoid arthritis: a multinational network cohort study. *Rheumatology (Oxford)*. 2021;60(7):3222-34. doi: 10.1093/rheumatology/keaa771. PubMed PMID: 33367863; PubMed Central PMCID: PMC7798671.
298. Kim HI, Yoon JY, Kwak MS, Cha JM. Gastrointestinal and Nongastrointestinal Complications of Esophagogastroduodenoscopy and Colonoscopy in the Real World: A Nationwide Standard Cohort Using the Common Data Model Database. *Gut Liver*. 2021;15(4):569-78. doi: 10.5009/gnl20222. PubMed PMID: 33402543; PubMed Central PMCID: PMC8283291.
299. Cronin RM, Halvorson AE, Springer C, Feng X, Suliman L, Loperena-Cortes R, Mayo K, Carroll RJ, Chen Q, Ahmedani BK, Karnes J, Korf B, O'Donnell CJ, Qian J, Ramirez AH. Comparison of family health history in surveys vs electronic health record data mapped to the observational medical outcomes partnership data model in the All of Us Research Program. *J Am Med Inform Assoc*. 2021;28(4):695-703. doi: 10.1093/jamia/ocaa315. PubMed PMID: 33404595; PubMed Central PMCID: PMC7973437.
300. Belenkaya R, Gurley MJ, Golozar A, Dymshyts D, Miller RT, Williams AE, Ratwani S, Siapos A, Korsik V, Warner J, Campbell WS, Rivera D, Banokina T, Modina E, Bethusamy S, Stewart HM, Patel M, Chen R, Falconer T, Park RW, You SC, Jeon H, Shin SJ, Reich C. Extending the OMOP Common Data Model and Standardized Vocabularies to Support Observational Cancer Research. *JCO Clin Cancer Inform*. 2021;5:12-20. doi: 10.1200/cci.20.00079. PubMed PMID: 33411620; PubMed Central PMCID: PMC8140810.
301. Schuemie MJ, Weinstein R, Ryan PB, Berlin JA. Quantifying bias in epidemiologic studies evaluating the association between acetaminophen use and cancer. *Regul Toxicol Pharmacol*. 2021;120:104866. Epub 20210115. doi: 10.1016/j.yrtph.2021.104866. PubMed PMID: 33454352.
302. Cepeda MS, Kern DM, Canuso CM. At baseline patients treated with esketamine have higher burden of disease than other patients with treatment resistant depression: Learnings from a population based study. *Depress Anxiety*. 2021;38(5):521-7. Epub 20210121. doi: 10.1002/da.23138. PubMed PMID: 33475213; PubMed Central PMCID: PMC8248018.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

303. Maier C, Kapsner LA, Mate S, Prokosch HU, Kraus S. Patient Cohort Identification on Time Series Data Using the OMOP Common Data Model. *Appl Clin Inform.* 2021;12(1):57-64. Epub 20210127. doi: 10.1055/s-0040-1721481. PubMed PMID: 33506478; PubMed Central PMCID: PMC7840432.
304. Burn E, Tebé C, Fernandez-Bertolin S, Aragon M, Recalde M, Roel E, Prats-Urbe A, Prieto-Alhambra D, Duarte-Salles T. The natural history of symptomatic COVID-19 during the first wave in Catalonia. *Nat Commun.* 2021;12(1):777. Epub 20210203. doi: 10.1038/s41467-021-21100-y. PubMed PMID: 33536436; PubMed Central PMCID: PMC7858639.
305. Reps JM, Rijnbeek P, Cuthbert A, Ryan PB, Pratt N, Schuemie M. An empirical analysis of dealing with patients who are lost to follow-up when developing prognostic models using a cohort design. *BMC Med Inform Decis Mak.* 2021;21(1):43. Epub 20210206. doi: 10.1186/s12911-021-01408-x. PubMed PMID: 33549087; PubMed Central PMCID: PMC7866757.
306. Ostropolets A, Elias PA, Reyes MV, Wan EY, Pajvani UB, Hripcsak G, Morrow JP. Metformin Is Associated With a Lower Risk of Atrial Fibrillation and Ventricular Arrhythmias Compared With Sulfonylureas: An Observational Study. *Circ Arrhythm Electrophysiol.* 2021;14(3):e009115. Epub 20210207. doi: 10.1161/circep.120.009115. PubMed PMID: 33554609; PubMed Central PMCID: PMC7969445.
307. Seong Y, You SC, Ostropolets A, Rho Y, Park J, Cho J, Dymshyts D, Reich CG, Heo Y, Park RW. Incorporation of Korean Electronic Data Interchange Vocabulary into Observational Medical Outcomes Partnership Vocabulary. *Healthc Inform Res.* 2021;27(1):29-38. Epub 20210131. doi: 10.4258/hir.2021.27.1.29. PubMed PMID: 33611874; PubMed Central PMCID: PMC7921574.
308. Reps JM, Kim C, Williams RD, Markus AF, Yang C, Duarte-Salles T, Falconer T, Jonnagaddala J, Williams A, Fernández-Bertolin S, DuVall SL, Kostka K, Rao G, Shoaibi A, Ostropolets A, Spotnitz ME, Zhang L, Casajust P, Steyerberg EW, Nyberg F, Kaas-Hansen BS, Choi YH, Morales D, Liaw ST, Abrahão MTF, Areia C, Matheny ME, Lynch KE, Aragón M, Park RW, Hripcsak G, Reich CG, Suchard MA, You SC, Ryan PB, Prieto-Alhambra D, Rijnbeek PR. Implementation of the COVID-19 Vulnerability Index Across an International Network of Health Care Data Sets: Collaborative External Validation Study. *JMIR Med Inform.* 2021;9(4):e21547. Epub 20210405. doi: 10.2196/21547. PubMed PMID: 33661754; PubMed Central PMCID: PMC8023380.
309. Wang J, Abu-El-Rub N, Gray J, Pham HA, Zhou Y, Manion FJ, Liu M, Song X, Xu H, Rouhizadeh M, Zhang Y. COVID-19 SignSym: a fast adaptation of a general clinical NLP tool to identify and normalize COVID-19 signs and symptoms to OMOP common data model. *J Am Med Inform Assoc.* 2021;28(6):1275-83. doi: 10.1093/jamia/ocab015. PubMed PMID: 33674830; PubMed Central PMCID: PMC7989301.
310. Park J, Lee SH, You SC, Kim J, Yang K. Effect of renin-angiotensin-aldosterone system inhibitors on Covid-19 patients in Korea. *PLoS One.* 2021;16(3):e0248058. Epub 20210311. doi: 10.1371/journal.pone.0248058. PubMed PMID: 33705440; PubMed Central PMCID: PMC7951918.
311. Callahan A, Polony V, Posada JD, Banda JM, Gombar S, Shah NH. ACE: the Advanced Cohort Engine for searching longitudinal patient records. *J Am Med Inform Assoc.* 2021;28(7):1468-79. doi: 10.1093/jamia/ocab027. PubMed PMID: 33712854; PubMed Central PMCID: PMC8279796.
312. Jeon H, You SC, Kang SY, Seo SI, Warner JL, Belenkaya R, Park RW. Characterizing the Anticancer Treatment Trajectory and Pattern in Patients Receiving Chemotherapy for Cancer Using Harmonized Observational Databases: Retrospective Study. *JMIR Med Inform.* 2021;9(4):e25035. Epub 20210406. doi: 10.2196/25035. PubMed PMID: 33720842; PubMed Central PMCID: PMC8058693.
313. Tan EH, Sena AG, Prats-Urbe A, You SC, Ahmed WU, Kostka K, Reich C, Duvall SL, Lynch KE, Matheny ME, Duarte-Salles T, Bertolin SF, Hripcsak G, Natarajan K, Falconer T, Spotnitz M, Ostropolets A, Blacketer C, Alshammari TM, Alghoul H, Alser O, Lane JCE, Dawoud DM, Shah K, Yang Y, Zhang L, Areia C, Golozar A, Recalde M, Casajust P, Jonnagaddala J, Subbian V, Vizcaya D, Lai LYH, Nyberg F, Morales DR, Posada JD, Shah NH, Gong M, Vivekanantham A, Abend A, Minty EP, Suchard M, Rijnbeek P, Ryan PB, Prieto-Alhambra D. COVID-19 in patients with autoimmune diseases: characteristics and outcomes in a multinational network of cohorts across three countries. *Rheumatology (Oxford).* 2021;60(Si):Si37-si50. doi: 10.1093/rheumatology/keab250. PubMed PMID: 33725121; PubMed Central PMCID: PMC7989171.
314. Chan You S, Krumholz HM, Suchard MA, Schuemie MJ, Hripcsak G, Chen R, Shea S, Duke J, Pratt N, Reich CG, Madigan D, Ryan PB, Woong Park R, Park S. Comprehensive Comparative Effectiveness and Safety of First-Line β -Blocker Monotherapy in Hypertensive Patients: A Large-Scale Multicenter Observational Study. *Hypertension.* 2021;77(5):1528-38. Epub 20210329. doi: 10.1161/hypertensionaha.120.16402. PubMed PMID: 33775125; PubMed Central PMCID: PMC8035236.
315. Kim JW, Kim S, Ryu B, Song W, Lee HY, Yoo S. Transforming electronic health record polysomnographic data into the Observational Medical Outcome Partnership's Common Data Model: a pilot feasibility study. *Sci Rep.* 2021;11(1):7013. Epub 20210329. doi: 10.1038/s41598-021-86564-w. PubMed PMID: 33782494; PubMed Central PMCID: PMC8007756.
316. Park J, You SC, Jeong E, Weng C, Park D, Roh J, Lee DY, Cheong JY, Choi JW, Kang M, Park RW. A Framework (SOCRAteX) for Hierarchical Annotation of Unstructured Electronic Health Records and Integration Into a Standardized Medical Database: Development and Usability Study. *JMIR Med Inform.* 2021;9(3):e23983. Epub 20210330. doi: 10.2196/23983. PubMed PMID: 33783361; PubMed Central PMCID: PMC8044740.
317. Liu H, Chi Y, Butler A, Sun Y, Weng C. A knowledge base of clinical trial eligibility criteria. *J Biomed Inform.* 2021;117:103771. Epub 20210401. doi: 10.1016/j.jbi.2021.103771. PubMed PMID: 33813032; PubMed Central PMCID: PMC8407851.
318. Rogers JR, Liu C, Hripcsak G, Cheung YK, Weng C. Comparison of Clinical Characteristics Between Clinical Trial Participants and Nonparticipants Using Electronic Health Record Data. *JAMA Netw Open.* 2021;4(4):e214732. Epub 20210401. doi: 10.1001/jamanetworkopen.2021.4732. PubMed PMID: 33825838; PubMed Central PMCID: PMC8027910.
319. Wang L, Swerdel JN, Weaver J, Weiss B, Pan G, Yuan Z, DiBattiste PM. Incidence rate of hospitalization and mortality in the first year following initial diagnosis of cardiac amyloidosis in the US claims databases. *Curr Med Res Opin.* 2021;37(8):1275-81. Epub 20210423. doi: 10.1080/03007995.2021.1913109. PubMed PMID: 33830834.
320. Lübbecke A, Smith JA, Prieto-Alhambra D, Carr AJ. The case for an academic discipline of medical device science. *EFORT Open Rev.* 2021;6(3):160-3. Epub 20210301. doi: 10.1302/2058-5241.6.200094. PubMed PMID: 33841914; PubMed Central PMCID: PMC8025702.
321. Hripcsak G, Schuemie MJ, Madigan D, Ryan PB, Suchard MA. Drawing Reproducible Conclusions from Observational Clinical Data with OHDSI. *Yearb Med Inform.* 2021;30(1):283-9. Epub 20210421. doi: 10.1055/s-0041-1726481. PubMed PMID: 33882595; PubMed Central PMCID: PMC8416226.
322. Sun Y, Butler A, Stewart LA, Liu H, Yuan C, Southard CT, Kim JH, Weng C. Building an OMOP common data model-compliant annotated corpus for COVID-19 clinical trials. *J Biomed Inform.* 2021;118:103790. Epub 20210428. doi: 10.1016/j.jbi.2021.103790. PubMed PMID: 33887457; PubMed Central PMCID: PMC8079156.
323. Vogelsang RP, Bojesen RD, Hoelmich ER, Orhan A, Buzquurz F, Cai L, Grube C, Zahid JA, Allakhverdiev E, Raskov HH, Drakos I, Derian N, Ryan PB, Rijnbeek PR, Gøgenur I. Prediction of 90-day mortality after surgery for colorectal cancer using standardized nationwide quality-assurance data. *BJS Open.* 2021;5(3). doi: 10.1093/bjsopen/zrab023. PubMed PMID: 33963368; PubMed Central PMCID: PMC8105588.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	167

OHDSI PUBLICATIONS

324. Prats-Uribe A, Sena AG, Lai LYH, Ahmed WU, Alghoul H, Alser O, Alshammari TM, Areia C, Carter W, Casajust P, Dawoud D, Golozar A, Jonnagaddala J, Mehta PP, Gong M, Morales DR, Nyberg F, Posada JD, Recalde M, Roel E, Shah K, Shah NH, Schilling LM, Subbian V, Vizcaya D, Zhang L, Zhang Y, Zhu H, Liu L, Cho J, Lynch KE, Matheny ME, You SC, Rijnbeek PR, Hripcsak G, Lane JC, Burn E, Reich C, Suchard MA, Duarte-Salles T, Kostka K, Ryan PB, Prieto-Alhambra D. Use of repurposed and adjuvant drugs in hospital patients with covid-19: multinational network cohort study. *Bmj*. 2021;373:n1038. Epub 20210511. doi: 10.1136/bmj.n1038. PubMed PMID: 33975825; PubMed Central PMCID: PMC8111167.
325. Shoabi A, Fortin SP, Weinstein R, Berlin JA, Ryan P. Comparative Effectiveness of Famotidine in Hospitalized COVID-19 Patients. *Am J Gastroenterol*. 2021;116(4):692-9. doi: 10.14309/ajg.000000000001153. PubMed PMID: 33982938.
326. Kang B, Yoon J, Kim HY, Jo SJ, Lee Y, Kam HJ. Deep-learning-based automated terminology mapping in OMOP-CDM. *J Am Med Inform Assoc*. 2021;28(7):1489-96. doi: 10.1093/jamia/ocab030. PubMed PMID: 33987667; PubMed Central PMCID: PMC8279781.
327. Lenert LA, Ilatovskiy AV, Agnew J, Rudisill P, Jacobs J, Weatherston D, Deans KR, Jr. Automated production of research data marts from a canonical fast healthcare interoperability resource data repository: applications to COVID-19 research. *J Am Med Inform Assoc*. 2021;28(8):1605-11. doi: 10.1093/jamia/ocab108. PubMed PMID: 33993254; PubMed Central PMCID: PMC8243354.
328. Shin H, Lee S. An OMOP-CDM based pharmacovigilance data-processing pipeline (PDP) providing active surveillance for ADR signal detection from real-world data sources. *BMC Med Inform Decis Mak*. 2021;21(1):159. Epub 20210517. doi: 10.1186/s12911-021-01520-y. PubMed PMID: 34001114; PubMed Central PMCID: PMC8130307.
329. Fortin SP, Johnston SS, Schuemie MJ. Applied comparison of large-scale propensity score matching and cardinality matching for causal inference in observational research. *BMC Med Res Methodol*. 2021;21(1):109. Epub 20210524. doi: 10.1186/s12874-021-01282-1. PubMed PMID: 34030640; PubMed Central PMCID: PMC8146256.
330. Yoon JY, Cha JM, Kim HI, Kwak MS. Seasonal variation of peptic ulcer disease, peptic ulcer bleeding, and acute pancreatitis: A nationwide population-based study using a common data model. *Medicine (Baltimore)*. 2021;100(21):e25820. doi: 10.1097/md.00000000000025820. PubMed PMID: 34032695; PubMed Central PMCID: PMC8154390.
331. Dimitriadis VK, Gavriilidis GI, Natsiavas P. Pharmacovigilance and Clinical Environment: Utilizing OMOP-CDM and OHDSI Software Stack to Integrate EHR Data. *Stud Health Technol Inform*. 2021;281:555-9. doi: 10.3233/shti210232. PubMed PMID: 34042637.
332. Zoch M, Gierschner C, Peng Y, Gruhl M, Leutner LA, Sedlmayr M, Bathelt F. Adaption of the OMOP CDM for Rare Diseases. *Stud Health Technol Inform*. 2021;281:138-42. doi: 10.3233/shti210136. PubMed PMID: 34042721.
333. Chen Z, Liu H, Butler A, Ostroplets A, Weng C. Potential Role of Clinical Trial Eligibility Criteria in Electronic Phenotyping. *Stud Health Technol Inform*. 2021;281:148-52. doi: 10.3233/shti210138. PubMed PMID: 34042723.
334. Boudis F, Clement G, Bruandet A, Lamer A. Automated Generation of Individual and Population Clinical Pathways with the OMOP Common Data Model. *Stud Health Technol Inform*. 2021;281:218-22. doi: 10.3233/shti210152. PubMed PMID: 34042737.
335. Rinaldi E, Thun S. From OpenEHR to FHIR and OMOP Data Model for Microbiology Findings. *Stud Health Technol Inform*. 2021;281:402-6. doi: 10.3233/shti210189. PubMed PMID: 34042774.
336. Majeed RW, Stöhr MR, Günther A. HStream-Import: A Generic ETL Framework for Processing Arbitrary Patient Data Collections or Hospital Information Systems into HL7 FHIR Bundles. *Stud Health Technol Inform*. 2021;278:75-9. doi: 10.3233/shti210053. PubMed PMID: 34042878.
337. Majeed RW, Fischer P, Günther A. Accessing OMOP Common Data Model Repositories with the i2b2 Webclient - Algorithm for Automatic Query Translation. *Stud Health Technol Inform*. 2021;278:251-9. doi: 10.3233/shti210077. PubMed PMID: 34042902.
338. Duarte-Salles T, Vizcaya D, Pistillo A, Casajust P, Sena AG, Lai LYH, Prats-Uribe A, Ahmed WU, Alshammari TM, Alghoul H, Alser O, Burn E, You SC, Areia C, Blacketer C, DuVall S, Falconer T, Fernandez-Bertolin S, Fortin S, Golozar A, Gong M, Tan EH, Huser V, Iveli P, Morales DR, Nyberg F, Posada JD, Recalde M, Roel E, Schilling LM, Shah NH, Shah K, Suchard MA, Zhang L, Zhang Y, Williams AE, Reich CG, Hripcsak G, Rijnbeek P, Ryan P, Kostka K, Prieto-Alhambra D. Thirty-Day Outcomes of Children and Adolescents With COVID-19: An International Experience. *Pediatrics*. 2021;148(3). Epub 20210528. doi: 10.1542/peds.2020-042929. PubMed PMID: 34049958.
339. Oh S, Sung M, Rhee Y, Hong N, Park YR. Evaluation of the Privacy Risks of Personal Health Identifiers and Quasi-Identifiers in a Distributed Research Network: Development and Validation Study. *JMIR Med Inform*. 2021;9(5):e24940. Epub 20210531. doi: 10.2196/24940. PubMed PMID: 34057426; PubMed Central PMCID: PMC8204238.
340. Kim GL, Yi YH, Hwang HR, Kim J, Park Y, Kim YJ, Lee JG, Tak YJ, Lee SH, Lee SY, Cho YH, Park EJ, Lee Y. The Risk of Osteoporosis and Osteoporotic Fracture Following the Use of Irritable Bowel Syndrome Medical Treatment: An Analysis Using the OMOP CDM Database. *J Clin Med*. 2021;10(9). Epub 20210510. doi: 10.3390/jcm10092044. PubMed PMID: 34068814; PubMed Central PMCID: PMC8126251.
341. Prats-Uribe A, Xie J, Prieto-Alhambra D, Petersen I. Smoking and COVID-19 Infection and Related Mortality: A Prospective Cohort Analysis of UK Biobank Data. *Clin Epidemiol*. 2021;13:357-65. Epub 20210525. doi: 10.2147/cep.S300597. PubMed PMID: 34079378; PubMed Central PMCID: PMC8164669.
342. Sharafeldin N, Bates B, Song Q, Madhira V, Yan Y, Dong S, Lee E, Kuhrt N, Shao YR, Liu F, Bergquist T, Guinney J, Su J, Topaloglu U. Outcomes of COVID-19 in Patients With Cancer: Report From the National COVID Cohort Collaborative (N3C). *J Clin Oncol*. 2021;39(20):2232-46. Epub 20210604. doi: 10.1200/jco.21.01074. PubMed PMID: 34085538; PubMed Central PMCID: PMC8260918.
343. Lee J, Liu C, Kim JH, Butler A, Shang N, Pang C, Natarajan K, Ryan P, Ta C, Weng C. Comparative effectiveness of medical concept embedding for feature engineering in phenotyping. *JAMIA Open*. 2021;4(2):oab028. Epub 20210616. doi: 10.1093/jamiaopen/ooab028. PubMed PMID: 34142015; PubMed Central PMCID: PMC8206403.
344. Mamidi TKK, Tran-Nguyen TK, Melvin RL, Worthey EA. Development of An Individualized Risk Prediction Model for COVID-19 Using Electronic Health Record Data. *Front Big Data*. 2021;4:675882. Epub 20210604. doi: 10.3389/fdata.2021.675882. PubMed PMID: 34151259; PubMed Central PMCID: PMC8211871.
345. Reeves RM, Christensen L, Brown JR, Conway M, Levis M, Gobbel GT, Shah RU, Goodrich C, Rickett I, Minter F, Bohm A, Bray BE, Matheny ME, Chapman W. Adaptation of an NLP system to a new healthcare environment to identify social determinants of health. *J Biomed Inform*. 2021;120:103851. Epub 20210624. doi: 10.1016/j.jbi.2021.103851. PubMed PMID: 34174396; PubMed Central PMCID: PMC8386129.
346. Gaudet-Blavignac C, Raisaro JL, Touré V, Österle S, Cramer K, Lovis C. A National, Semantic-Driven, Three-Pillar Strategy to Enable Health Data Secondary Usage Interoperability for Research Within the Swiss Personalized Health Network: Methodological Study. *JMIR Med Inform*. 2021;9(6):e27591. Epub 20210624. doi: 10.2196/27591. PubMed PMID: 34185008; PubMed Central PMCID: PMC8277320.
347. Almeida JR, Silva JF, Matos S, Oliveira JL. A two-stage workflow to extract and harmonize drug mentions from clinical notes into observational databases. *J Biomed Inform*. 2021;120:103849. Epub 20210630. doi: 10.1016/j.jbi.2021.103849. PubMed PMID: 34214696.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

348. Bennett TD, Moffitt RA, Hajagos JG, Amor B, Anand A, Bissell MM, Bradwell KR, Bremer C, Byrd JB, Denham A, DeWitt PE, Gabriel D, Garibaldi BT, Girvin AT, Guinney J, Hill EL, Hong SS, Jimenez H, Kavuluru R, Kostka K, Lehmann HP, Levitt E, Mallipattu SK, Manna A, McMurry JA, Morris M, Muschelli J, Neumann AJ, Palchuk MB, Pfaff ER, Qian Z, Qureshi N, Russell S, Spratt H, Walden A, Williams AE, Wooldridge JT, Yoo YJ, Zhang XT, Zhu RL, Austin CP, Saltz JH, Gersing KR, Haendel MA, Chute CG. Clinical Characterization and Prediction of Clinical Severity of SARS-CoV-2 Infection Among US Adults Using Data From the US National COVID Cohort Collaborative. *JAMA Netw Open*. 2021;4(7):e2116901. Epub 20210701. doi: 10.1001/jamanetworkopen.2021.16901. PubMed PMID: 34255046; PubMed Central PMCID: PMC8278272.
349. Recalde M, Roel E, Pistillo A, Sena AG, Prats-Urbe A, Ahmed WU, Alghoul H, Alshammari TM, Alser O, Areia C, Burn E, Casajust P, Dawoud D, DuVall SL, Falconer T, Fernández-Bertolín S, Golozar A, Gong M, Lai LYH, Lane JCE, Lynch KE, Matheny ME, Mehta PP, Morales DR, Natarjan K, Nyberg F, Posada JD, Reich CG, Rijnbeek PR, Schilling LM, Shah K, Shah NH, Subbian V, Zhang L, Zhu H, Ryan P, Prieto-Alhambra D, Kostka K, Duarte-Salles T. Characteristics and outcomes of 627 044 COVID-19 patients living with and without obesity in the United States, Spain, and the United Kingdom. *Int J Obes (Lond)*. 2021;45(11):2347-57. Epub 20210715. doi: 10.1038/s41366-021-00893-4. PubMed PMID: 34267326; PubMed Central PMCID: PMC8281807.
350. Roel E, Pistillo A, Recalde M, Sena AG, Fernández-Bertolín S, Aragón M, Puente D, Ahmed WU, Alghoul H, Alser O, Alshammari TM, Areia C, Blacketer C, Carter W, Casajust P, Culhane AC, Dawoud D, DeFalco F, DuVall SL, Falconer T, Golozar A, Gong M, Hester L, Hripcsak G, Tan EH, Jeon H, Jonnagaddala J, Lai LYH, Lynch KE, Matheny ME, Morales DR, Natarajan K, Nyberg F, Ostropolets A, Posada JD, Prats-Urbe A, Reich CG, Rivera DR, Schilling LM, Soerjomataram I, Shah K, Shah NH, Shen Y, Spotniz M, Subbian V, Suchard MA, Trama A, Zhang L, Zhang Y, Ryan PB, Prieto-Alhambra D, Kostka K, Duarte-Salles T. Characteristics and Outcomes of Over 300,000 Patients with COVID-19 and History of Cancer in the United States and Spain. *Cancer Epidemiol Biomarkers Prev*. 2021;30(10):1884-94. Epub 20210716. doi: 10.1158/1055-9965.Epi-21-0266. PubMed PMID: 34272262.
351. Ge J, Pletcher MJ, Lai JC. Outcomes of SARS-CoV-2 Infection in Patients With Chronic Liver Disease and Cirrhosis: A National COVID Cohort Collaborative Study. *Gastroenterology*. 2021;161(5):1487-501.e5. Epub 20210718. doi: 10.1053/j.gastro.2021.07.010. PubMed PMID: 34284037; PubMed Central PMCID: PMC8286237.
352. Schüttler C, Prokosch HU, Sedlmayr M, Sedlmayr B. Evaluation of Three Feasibility Tools for Identifying Patient Data and Biospecimen Availability: Comparative Usability Study. *JMIR Med Inform*. 2021;9(7):e25531. Epub 20210721. doi: 10.2196/25531. PubMed PMID: 34287211; PubMed Central PMCID: PMC8339981.
353. Catala M, Coma E, Alonso S, Álvarez-Lacalle E, Cordomi S, López D, Fina F, Medina-Peralta M, Prats C, Prieto-Alhambra D. Risk Diagrams Based on Primary Care Electronic Medical Records and Linked Real-Time PCR Data to Monitor Local COVID-19 Outbreaks During the Summer 2020: A Prospective Study Including 7,671,862 People in Catalonia. *Front Public Health*. 2021;9:693956. Epub 20210705. doi: 10.3389/fpubh.2021.693956. PubMed PMID: 34291033; PubMed Central PMCID: PMC8287173.
354. Giangreco NP, Tatonetti NP. Evaluating risk detection methods to uncover ontogenic-mediated adverse drug effect mechanisms in children. *BioData Min*. 2021;14(1):34. Epub 20210722. doi: 10.1186/s13040-021-00264-9. PubMed PMID: 34294093; PubMed Central PMCID: PMC8296590.
355. Chen R, Suchard MA, Krumholz HM, Schuemie MJ, Shea S, Duke J, Pratt N, Reich CG, Madigan D, You SC, Ryan PB, Hripcsak G. Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers: A Multinational Cohort Study. *Hypertension*. 2021;78(3):591-603. Epub 20210726. doi: 10.1161/hypertensionaha.120.16667. PubMed PMID: 34304580; PubMed Central PMCID: PMC8363588.
356. Blacketer C, Defalco FJ, Ryan PB, Rijnbeek PR. Increasing trust in real-world evidence through evaluation of observational data quality. *J Am Med Inform Assoc*. 2021;28(10):2251-7. doi: 10.1093/jamia/ocab132. PubMed PMID: 34313749; PubMed Central PMCID: PMC8449628.
357. Hankey GJ. Evolution of Evidence-Based Medicine in Stroke. *Cerebrovasc Dis*. 2021;50(6):644-55. Epub 20210727. doi: 10.1159/000517679. PubMed PMID: 34315156.
358. Bhuyan P, Medin J, da Silva HG, Yadavalli M, Shankar NK, Mullerova H, Arnold M, Nord M. Very rare thrombosis with thrombocytopenia after second AZD1222 dose: a global safety database analysis. *Lancet*. 2021;398(10300):577-8. Epub 20210727. doi: 10.1016/s0140-6736(21)01693-7. PubMed PMID: 34329583.
359. Ostropolets A, Zachariah P, Ryan P, Chen R, Hripcsak G. Data Consult Service: Can we use observational data to address immediate clinical needs? *J Am Med Inform Assoc*. 2021;28(10):2139-46. doi: 10.1093/jamia/ocab122. PubMed PMID: 34333606; PubMed Central PMCID: PMC8449613.
360. Sathappan SMK, Jeon YS, Dang TK, Lim SC, Shao YM, Tai ES, Feng M. Transformation of Electronic Health Records and Questionnaire Data to OMOP CDM: A Feasibility Study Using SG_T2DM Dataset. *Appl Clin Inform*. 2021;12(4):757-67. Epub 20210811. doi: 10.1055/s-0041-1732301. PubMed PMID: 34380168; PubMed Central PMCID: PMC8357458.
361. Yuan C, Ryan PB, Ta CN, Kim JH, Li Z, Weng C. From clinical trials to clinical practice: How long are drugs tested and then used by patients? *J Am Med Inform Assoc*. 2021;28(11):2456-60. doi: 10.1093/jamia/ocab164. PubMed PMID: 34389867; PubMed Central PMCID: PMC8510283.
362. Alser O, Abram SGF, Craig RS, Lane JCE, Shaw AV, Prats-Urbe A, Rees JL, Prieto-Alhambra D, Furniss D. Temporal Trends and Geographical Variation in Dupuytren Disease Surgery in England: A Population-Based Cohort Study. *Ann Plast Surg*. 2021;87(3):265-70. doi: 10.1097/sap.0000000000002734. PubMed PMID: 34397515.
363. Hardin J, Reys JM. Evaluating the impact of covariate lookback times on performance of patient-level prediction models. *BMC Med Res Methodol*. 2021;21(1):180. Epub 20210828. doi: 10.1186/s12874-021-01370-2. PubMed PMID: 34454423; PubMed Central PMCID: PMC8403343.
364. Li X, Liu H, Kury F, Yuan C, Butler A, Sun Y, Ostropolets A, Xu H, Weng C. A Comparison between Human and NLP-based Annotation of Clinical Trial Eligibility Criteria Text Using The OMOP Common Data Model. *AMIA Jt Summits Transl Sci Proc*. 2021;2021:394-403. Epub 20210517. PubMed PMID: 34457154; PubMed Central PMCID: PMC8378608.
365. Sun Y, Butler A, Diallo I, Kim JH, Ta C, Rogers JR, Liu H, Weng C. A Framework for Systematic Assessment of Clinical Trial Population Representativeness Using Electronic Health Records Data. *Appl Clin Inform*. 2021;12(4):816-25. Epub 20210908. doi: 10.1055/s-0041-1733846. PubMed PMID: 34496418; PubMed Central PMCID: PMC8426045.
366. Papez V, Moinat M, Payralbe S, Asselbergs FW, Lumbers RT, Hemingway H, Dobson R, Denaxas S. Transforming and evaluating electronic health record disease phenotyping algorithms using the OMOP common data model: a case study in heart failure. *JAMIA Open*. 2021;4(3):ooab001. Epub 20210204. doi: 10.1093/jamiaopen/ooab001. PubMed PMID: 34514354; PubMed Central PMCID: PMC8423424.
367. Lee KA, Jin HY, Kim YJ, Im YJ, Kim EY, Park TS. Treatment Patterns of Type 2 Diabetes Assessed Using a Common Data Model Based on Electronic Health Records of 2000-2019. *J Korean Med Sci*. 2021;36(36):e230. Epub 20210913. doi: 10.3346/jkms.2021.36.e230. PubMed PMID: 34519186; PubMed Central PMCID: PMC8438187.
368. Prats-Urbe A, Tobed M, Villacampa JM, Agüero A, García-Bastida C, Tato JI, Rodríguez L, Holguera VD, Hernández-García E, Poletti D, Simonetti G, Villarraga V, Meler-Claramonte C, Sánchez Barrueco Á, Chiesa-Estomba C, Casasayas M, Parente-Arias P, Mata-Castro N, Rello J, Castro P, Prieto-Alhambra D, Vilaseca I, Avilés-Jurado FX. Timing of elective tracheotomy and duration of mechanical ventilation among patients admitted to intensive care with severe COVID-19: A multicenter prospective cohort study. *Head Neck*. 2021;43(12):3743-56. Epub 20210915. doi: 10.1002/hed.26863. PubMed PMID: 34524714; PubMed Central PMCID: PMC8652734.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	167

OHDSI PUBLICATIONS

369. Lee SH, Chun KJ, Park J, Kim J, Sung JD, Park RW, Choi J, Yang K. Angiotensin converting enzyme inhibitors and incidence of lung cancer in a population based cohort of common data model in Korea. *Sci Rep.* 2021;11(1):18576. Epub 20210917. doi: 10.1038/s41598-021-97989-8. PubMed PMID: 34535723; PubMed Central PMCID: PMC8448874.
370. Peng Y, Nassirian A, Ahmadi N, Sedlmayr M, Bathelt F. Towards the Representation of Genomic Data in HL7 FHIR and OMOP CDM. *Stud Health Technol Inform.* 2021;283:86-94. doi: 10.3233/shti210545. PubMed PMID: 34545823.
371. Reinecke I, Zoch M, Reich C, Sedlmayr M, Bathelt F. The Usage of OHDSI OMOP - A Scoping Review. *Stud Health Technol Inform.* 2021;283:95-103. doi: 10.3233/shti210546. PubMed PMID: 34545824.
372. Català M, Li X, Prats C, Prieto-Alhambra D. The impact of prioritisation and dosing intervals on the effects of COVID-19 vaccination in Europe: an agent-based cohort model. *Sci Rep.* 2021;11(1):18812. Epub 20210922. doi: 10.1038/s41598-021-98216-0. PubMed PMID: 34552139; PubMed Central PMCID: PMC8458447.
373. Khalid S, Yang C, Blacketer C, Duarte-Salles T, Fernández-Bertolín S, Kim C, Park RW, Park J, Schuemie MJ, Sena AG, Suchard MA, You SC, Rijnbeek PR, Reys JM. A standardized analytics pipeline for reliable and rapid development and validation of prediction models using observational health data. *Comput Methods Programs Biomed.* 2021;211:106394. Epub 20210906. doi: 10.1016/j.cmpb.2021.106394. PubMed PMID: 34560604; PubMed Central PMCID: PMC8420135.
374. Ryu B, Yoo S, Kim S, Choi J. Development of Prediction Models for Unplanned Hospital Readmission within 30 Days Based on Common Data Model: A Feasibility Study. *Methods Inf Med.* 2021;60(S 02):e65-e75. Epub 20210928. doi: 10.1055/s-0041-1735166. PubMed PMID: 34583416; PubMed Central PMCID: PMC8714301.
375. Abbasi J. Choose ARBs Over ACE Inhibitors for First-line Hypertension Treatment, Large New Analysis Suggests. *Jama.* 2021;326(13):1244-5. doi: 10.1001/jama.2021.14017. PubMed PMID: 34609454.
376. Lee JH, Kim S, Kim K, Chai YJ, Yu HW, Kim SJ, Choi JY, Chung YS, Lee KE, Yi KH. Assessment of Inter-Institutional Post-Operative Hypoparathyroidism Status Using a Common Data Model. *J Clin Med.* 2021;10(19). Epub 20210928. doi: 10.3390/jcm10194454. PubMed PMID: 34640472; PubMed Central PMCID: PMC8509408.
377. Wood WA, Marks P, Plovnick RM, Hewitt K, Neuberger DS, Walters S, Dolan BK, Tucker EA, Abrams CS, Thompson AA, Anderson KC, Kluetz P, Farrell A, Rivera D, Gertzog M, Pappas G. ASH Research Collaborative: a real-world data infrastructure to support real-world evidence development and learning healthcare systems in hematology. *Blood Adv.* 2021;5(23):5429-38. doi: 10.1182/bloodadvances.2021005902. PubMed PMID: 34673922; PubMed Central PMCID: PMC9153041.
378. Lamer A, Abou-Arab O, Bourgeois A, Parrot A, Popoff B, Beuscart JB, Tavernier B, Moussa MD. Transforming Anesthesia Data Into the Observational Medical Outcomes Partnership Common Data Model: Development and Usability Study. *J Med Internet Res.* 2021;23(10):e29259. Epub 20211029. doi: 10.2196/29259. PubMed PMID: 34714250; PubMed Central PMCID: PMC8590192.
379. Biedermann P, Ong R, Davydov A, Orlova A, Solovyev P, Sun H, Wetherill G, Brand M, Didden EM. Standardizing registry data to the OMOP Common Data Model: experience from three pulmonary hypertension databases. *BMC Med Res Methodol.* 2021;21(1):238. Epub 20211102. doi: 10.1186/s12874-021-01434-3. PubMed PMID: 34727871; PubMed Central PMCID: PMC8565035.
380. Mun Y, You SC, Lee DY, Kim S, Chung YR, Lee K, Song JH, Park YG, Park YH, Roh YJ, Woo SJ, Park KH, Park RW, Yoo S, Chang DJ, Park SJ. Real-world incidence of endophthalmitis after intravitreal anti-VEGF injections in Korea: findings from the Common Data Model in ophthalmology. *Epidemiol Health.* 2021;43:e2021097. Epub 20211109. doi: 10.4178/epih.e2021097. PubMed PMID: 34773936; PubMed Central PMCID: PMC8864106.
381. Gabetta M, Alloni A, Polce F, Lanzola G, Parimbelli E, Barbarini N. Development of a FHIR Layer on Top of the OMOP Common Data Model for the CAPABLE Project. *Stud Health Technol Inform.* 2021;287:28-9. doi: 10.3233/shti210804. PubMed PMID: 34795073.
382. Girani E, Gabetta M, Alloni A, Stuppia M, Sacchi L, Barbarini N. Automatic Data Transfer from OMOP-CDM to REDCap: A Semantically-Enriched Framework. *Stud Health Technol Inform.* 2021;287:30-1. doi: 10.3233/shti210805. PubMed PMID: 34795074.
383. Reinecke I, Zoch M, Wilhelm M, Sedlmayr M, Bathelt F. Transfer of Clinical Drug Data to a Research Infrastructure on OMOP - A FAIR Concept. *Stud Health Technol Inform.* 2021;287:63-7. doi: 10.3233/shti210815. PubMed PMID: 34795082.
384. Pedrera M, Garcia N, Rubio P, Cruz JL, Bernal JL, Serrano P. Making EHRs Reusable: A Common Framework of Data Operations. *Stud Health Technol Inform.* 2021;287:129-33. doi: 10.3233/shti210831. PubMed PMID: 34795096.
385. Ethier JF, Goyer F, Fabry P, Barton A. The Prescription of Drug Ontology 2.0 (PDRO): More Than the Sum of Its Parts. *Int J Environ Res Public Health.* 2021;18(22). Epub 20211116. doi: 10.3390/ijerph182212025. PubMed PMID: 34831777; PubMed Central PMCID: PMC8619589.
386. Ye Y, Barapatre S, Davis MK, Elliston KO, Davatzikos C, Fedorov A, Fillion-Robin JC, Foster I, Gilbertson JR, Lasso A, Miller JV, Morgan M, Pieper S, Raumann BE, Sarachan BD, Savova G, Silverstein JC, Taylor DP, Zelnis JB, Zhang GQ, Cuticchia J, Becich MJ. Open-source Software Sustainability Models: Initial White Paper From the Informatics Technology for Cancer Research Sustainability and Industry Partnership Working Group. *J Med Internet Res.* 2021;23(12):e20028. Epub 20211202. doi: 10.2196/20028. PubMed PMID: 34860667; PubMed Central PMCID: PMC8686402.
387. Li X, Lai LY, Ostropelets A, Arshad F, Tan EH, Casajust P, Alshammari TM, Duarte-Salles T, Minty EP, Areia C, Pratt N, Ryan PB, Hripcsak G, Suchard MA, Schuemie MJ, Prieto-Alhambra D. Bias, Precision and Timeliness of Historical (Background) Rate Comparison Methods for Vaccine Safety Monitoring: An Empirical Multi-Database Analysis. *Front Pharmacol.* 2021;12:773875. Epub 20211124. doi: 10.3389/fphar.2021.773875. PubMed PMID: 34899334; PubMed Central PMCID: PMC8652333.
388. Paris N, Lamer A, Parrot A. Transformation and Evaluation of the MIMIC Database in the OMOP Common Data Model: Development and Usability Study. *JMIR Med Inform.* 2021;9(12):e30970. Epub 20211214. doi: 10.2196/30970. PubMed PMID: 34904958; PubMed Central PMCID: PMC8715361.
389. Choi S, Choi SJ, Kim JK, Nam KC, Lee S, Kim JH, Lee YK. Preliminary feasibility assessment of CDM-based active surveillance using current status of medical device data in medical records and OMOP-CDM. *Sci Rep.* 2021;11(1):24070. Epub 20211215. doi: 10.1038/s41598-021-03332-6. PubMed PMID: 34911976; PubMed Central PMCID: PMC8674329.
390. Nestsiarovich A, Reys JM, Matheny ME, DuVall SL, Lynch KE, Beaton M, Jiang X, Spotnitz M, Pfohl SR, Shah NH, Torre CO, Reich CG, Lee DY, Son SJ, You SC, Park RW, Ryan PB, Lambert CG. Predictors of diagnostic transition from major depressive disorder to bipolar disorder: a retrospective observational network study. *Transl Psychiatry.* 2021;11(1):642. Epub 20211220. doi: 10.1038/s41398-021-01760-6. PubMed PMID: 34930903; PubMed Central PMCID: PMC8688463.
391. Reyes C, Pistillo A, Fernández-Bertolín S, Recalde M, Roel E, Puente D, Sena AG, Blacketer C, Lai L, Alshammari TM, Ahmed WU, Alser O, Alghoul H, Areia C, Dawoud D, Prats-Urbe A, Valveny N, de Maeztu G, Sorlí Redó L, Martínez Roldán J, López Montesinos I, Schilling LM, Golozar A, Reich C, Posada JD, Shah N, You SC, Lynch KE, DuVall SL, Matheny ME, Nyberg F, Ostropelets A, Hripcsak G, Rijnbeek PR, Suchard MA, Ryan P, Kostka K, Duarte-Salles T. Characteristics and outcomes of patients with COVID-19 with and without prevalent hypertension: a multinational cohort study. *BMJ Open.* 2021;11(12):e057632. Epub 20211222. doi: 10.1136/bmjopen-2021-057632. PubMed PMID: 34937726; PubMed Central PMCID: PMC8704062.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thu Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

392. Reps JM, Ryan P, Rijnbeek PR. Investigating the impact of development and internal validation design when training prognostic models using a retrospective cohort in big US observational healthcare data. *BMJ Open*. 2021;11(12):e050146. Epub 20211224. doi: 10.1136/bmjopen-2021-050146. PubMed PMID: 34952871; PubMed Central PMCID: PMC8710861.
393. Ji X, Cui G, Xu C, Hou J, Zhang Y, Ren Y. Combining a Pharmacological Network Model with a Bayesian Signal Detection Algorithm to Improve the Detection of Adverse Drug Events. *Front Pharmacol*. 2021;12:773135. Epub 20220103. doi: 10.3389/fphar.2021.773135. PubMed PMID: 35046809; PubMed Central PMCID: PMC8762263.
394. Phuong J, Zampino E, Dobbins N, Espinoza J, Meeker D, Spratt H, Madlock-Brown C, Weiskopf NG, Wilcox A. Extracting Patient-level Social Determinants of Health into the OMOP Common Data Model. *AMIA Annu Symp Proc*. 2021;2021:989-98. Epub 20220221. PubMed PMID: 35308947; PubMed Central PMCID: PMC8861735.
395. Li X, Ostropolets A, Makadia R, Shoaibi A, Rao G, Sena AG, Martinez-Hernandez E, Delmestri A, Verhamme K, Rijnbeek PR, Duarte-Salles T, Suchard MA, Ryan PB, Hripcsak G, Prieto-Alhambra D. Characterising the background incidence rates of adverse events of special interest for covid-19 vaccines in eight countries: multinational network cohort study. *Bmj*. 2021;373:n1435. Epub 20210614. doi: 10.1136/bmj.n1435. PubMed PMID: 35727911; PubMed Central PMCID: PMC8193077.
396. Kim JE, Choi YJ, Oh SW, Kim MG, Jo SK, Cho WY, Ahn SY, Kwon YJ, Ko GJ. The Effect of Statins on Mortality of Patients With Chronic Kidney Disease Based on Data of the Observational Medical Outcomes Partnership Common Data Model (OMOP-CDM) and Korea National Health Insurance Claims Database. *Front Nephrol*. 2021;1:821585. Epub 20220202. doi: 10.3389/fneph.2021.821585. PubMed PMID: 37674813; PubMed Central PMCID: PMC10479676.
397. Sivesind TE, Runion T, Branda M, Schilling LM, Dellavalle RP. Dermatologic Research Potential of the Observational Health Data Sciences and Informatics (OHDSI) Network. *Dermatology*. 2022;238(1):44-52. Epub 20210318. doi: 10.1159/000514536. PubMed PMID: 33735862.
398. Khalid S, Reyes C, Ernst M, Delmestri A, Toth E, Libanati C, Abrahamsen B, Prieto-Alhambra D. One- and 2-year incidence of osteoporotic fracture: a multi-cohort observational study using routinely collected real-world data. *Osteoporos Int*. 2022;33(1):123-37. Epub 20210815. doi: 10.1007/s00198-021-06077-0. PubMed PMID: 34392386; PubMed Central PMCID: PMC8758600.
399. Matthewman J, Mansfield KE, Prieto-Alhambra D, Mulick AR, Smeeth L, Lowe KE, Silverwood RJ, Langan SM. Atopic Eczema-Associated Fracture Risk and Oral Corticosteroids: A Population-Based Cohort Study. *J Allergy Clin Immunol Pract*. 2022;10(1):257-66.e8. Epub 20210924. doi: 10.1016/j.jaip.2021.09.026. PubMed PMID: 34571200; PubMed Central PMCID: PMC7612204.
400. Pfaff ER, Girvin AT, Gabriel DL, Kostka K, Morris M, Palchuk MB, Lehmann HP, Amor B, Bissell M, Bradwell KR, Gold S, Hong SS, Loomba J, Manna A, McMurry JA, Niehaus E, Qureshi N, Walden A, Zhang XT, Zhu RL, Moffitt RA, Haendel MA, Chute CG, Adams WG, Al-Shukri S, Anzalone A, Baghal A, Bennett TD, Bernstam EV, Bernstam EV, Bissell MM, Bush B, Campion TR, Castro V, Chang J, Chaudhari DD, Chen W, Chu S, Cimino JJ, Crandall KA, Crooks M, Davies SJD, DiPalazzo J, Dorr D, Eckrich D, Eltinge SE, Fort DG, Golovko G, Gupta S, Haendel MA, Hajagos JG, Hanauer DA, Harnett BM, Horswell R, Huang N, Johnson SG, Kahn M, Khanipov K, Kieler C, Luzuriaga KR, Maidlow S, Martinez A, Mathew J, McClay JC, McMahan G, Melancon B, Meystre S, Miele L, Morizono H, Pablo R, Patel L, Phuong J, Popham DJ, Pulgarin C, Santos C, Sarkar IN, Sazo N, Setoguchi S, Soby S, Surampalli S, Suver C, Vangala UMR, Visweswaran S, Oehsen JV, Walters KM, Wiley L, Williams DA, Zai A. Synergies between centralized and federated approaches to data quality: a report from the national COVID cohort collaborative. *J Am Med Inform Assoc*. 2022;29(4):609-18. doi: 10.1093/jamia/ocab217. PubMed PMID: 34590684; PubMed Central PMCID: PMC8500110.
401. Canoy D, Harvey NC, Prieto-Alhambra D, Cooper C, Meyer HE, Åsvold BO, Nazarzadeh M, Rahimi K. Elevated blood pressure, antihypertensive medications and bone health in the population: revisiting old hypotheses and exploring future research directions. *Osteoporos Int*. 2022;33(2):315-26. Epub 20211013. doi: 10.1007/s00198-021-06190-0. PubMed PMID: 34642814; PubMed Central PMCID: PMC8813726.
402. Lynch KE, Shipherd JC, Gatsby E, Viernes B, DuVall SL, Blosnich JR. Sexual orientation-related disparities in health conditions that elevate COVID-19 severity. *Ann Epidemiol*. 2022;66:5-12. Epub 20211114. doi: 10.1016/j.annepidem.2021.11.006. PubMed PMID: 34785397; PubMed Central PMCID: PMC8601164.
403. Schuemie MJ, Chen Y, Madigan D, Suchard MA. Combining cox regressions across a heterogeneous distributed research network facing small and zero counts. *Stat Methods Med Res*. 2022;31(3):438-50. Epub 20211129. doi: 10.1177/09622802211060518. PubMed PMID: 34841975.
404. Williams RD, Reps JM, Rijnbeek PR, Ryan PB, Prieto-Alhambra D. 90-Day all-cause mortality can be predicted following a total knee replacement: an international, network study to develop and validate a prediction model. *Knee Surg Sports Traumatol Arthrosc*. 2022;30(9):3068-75. Epub 20211206. doi: 10.1007/s00167-021-06799-y. PubMed PMID: 34870731; PubMed Central PMCID: PMC9418076.
405. Lee E, Karim H, Andreescu C, Mizuno A, Aizenstein H, Lee H, Lee D, Lee K, Cho SM, Kim D, Park RW, Son SJ, Park B. Network modeling of anxiety and psychological characteristics on suicidal behavior: Cross-sectional study. *J Affect Disord*. 2022;299:545-52. Epub 20211221. doi: 10.1016/j.jad.2021.12.050. PubMed PMID: 34952111.
406. Seo SI, Park CH, Kim TJ, Bang CS, Kim JY, Lee KJ, Kim J, Kim HH, You SC, Shin WG. Aspirin, metformin, and statin use on the risk of gastric cancer: A nationwide population-based cohort study in Korea with systematic review and meta-analysis. *Cancer Med*. 2022;11(4):1217-31. Epub 20211230. doi: 10.1002/cam4.4514. PubMed PMID: 34970858; PubMed Central PMCID: PMC8855895.
407. Morales DR, Ostropolets A, Lai L, Sena A, Duvall S, Suchard M, Verhamme K, Rijnbeek P, Posada J, Ahmed W, Alshammary T, Alghoul H, Alser O, Areia C, Blacketer C, Burn E, Casajust P, You SC, Dawoud D, Golozar A, Gong M, Jonnagaddala J, Lynch K, Matheny M, Minty E, Nyberg F, Uribe A, Recalde M, Reich C, Scheumie M, Shah K, Shah N, Schilling L, Vizcaya D, Zhang L, Hripcsak G, Ryan P, Prieto-Alhambra D, Durate-Salles T, Kostka K. Characteristics and outcomes of COVID-19 patients with and without asthma from the United States, South Korea, and Europe. *J Asthma*. 2022;1-11. Epub 20220211. doi: 10.1080/02770903.2021.2025392. PubMed PMID: 35012410.
408. Park C, You SC, Jeon H, Jeong CW, Choi JW, Park RW. Development and Validation of the Radiology Common Data Model (R-CDM) for the International Standardization of Medical Imaging Data. *Yonsei Med J*. 2022;63(Suppl):S74-s83. doi: 10.3349/ymj.2022.63.S74. PubMed PMID: 35040608; PubMed Central PMCID: PMC8790584.
409. Yang C, Kors JA, Ioannou S, John LH, Markus AF, Rekkas A, de Ridder MAJ, Seinen TM, Williams RD, Rijnbeek PR. Trends in the conduct and reporting of clinical prediction model development and validation: a systematic review. *J Am Med Inform Assoc*. 2022;29(5):983-9. doi: 10.1093/jamia/ocac002. PubMed PMID: 35045179; PubMed Central PMCID: PMC9006694.
410. Yu Y, Zong N, Wen A, Liu S, Stone DJ, Knaack D, Chamberlain AM, Pfaff E, Gabriel D, Chute CG, Shah N, Jiang G. Developing an ETL tool for converting the PCORnet CDM into the OMOP CDM to facilitate the COVID-19 data integration. *J Biomed Inform*. 2022;127:104002. Epub 20220122. doi: 10.1016/j.jbi.2022.104002. PubMed PMID: 35077901; PubMed Central PMCID: PMC8791245.
411. Williams RD, Markus AF, Yang C, Duarte-Salles T, DuVall SL, Falconer T, Jonnagaddala J, Kim C, Rho Y, Williams AE, Machado AA, An MH, Aragón M, Areia C, Burn E, Choi YH, Drakos I, Abrahão MTF, Fernández-Bertolín S, Hripcsak G, Kaas-Hansen BS, Kandukuri PL, Kors JA, Kostka K, Liaw ST, Lynch KE, Machnicki G, Matheny ME, Morales D, Nyberg F, Park RW, Prats-Urbe A, Pratt N, Rao G, Reich CG, Rivera M, Seinen T, Shoaibi A, Spotnitz ME, Steyerberg EW, Suchard MA, You SC, Zhang L, Zhou L, Ryan PB, Prieto-Alhambra D, Reps JM, Rijnbeek PR. Seek COVER: using a disease proxy to rapidly develop and validate a personalized risk calculator for COVID-19 outcomes in an international network. *BMC Med Res Methodol*. 2022;22(1):35. Epub 20220130. doi: 10.1186/s12874-022-01505-z. PubMed PMID: 35094685; PubMed Central PMCID: PMC8801189.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	167

412. Lavallee M, Yu T, Evans L, Van Hemelrijck M, Bosco C, Golozar A, Asiimwe A. Evaluating the performance of temporal pattern discovery: new application using statins and rhabdomyolysis in OMOP databases. *BMC Med Inform Decis Mak.* 2022;22(1):31. Epub 20220203. doi: 10.1186/s12911-022-01765-1. PubMed PMID: 35115001; PubMed Central PMCID: PMC8812213.
413. Kaneko K, Prieto-Alhambra D, Jacklin C, Bosworth A, Dickinson S, Berry S, McAteer H, Taylor PC. Influence of information provided prior to switching from Humira to biosimilar adalimumab on UK patients' satisfaction: a cross-sectional survey by patient organisations. *BMJ Open.* 2022;12(2):e050949. Epub 20220216. doi: 10.1136/bmjopen-2021-050949. PubMed PMID: 35172995; PubMed Central PMCID: PMC8852668.
414. Burn E, Li X, Kostka K, Stewart HM, Reich C, Seager S, Duarte-Salles T, Fernandez-Bertolin S, Aragón M, Reyes C, Martinez-Hernandez E, Marti E, Delmestri A, Verhamme K, Rijnbeek P, Horban S, Morales DR, Prieto-Alhambra D. Background rates of five thrombosis with thrombocytopenia syndromes of special interest for COVID-19 vaccine safety surveillance: Incidence between 2017 and 2019 and patient profiles from 38.6 million people in six European countries. *Pharmacoepidemiol Drug Saf.* 2022;31(5):495-510. Epub 20220227. doi: 10.1002/pds.5419. PubMed PMID: 35191114; PubMed Central PMCID: PMC9088543.
415. Lee SH, Park J, Park RW, Shin SJ, Kim J, Sung JD, Kim DJ, Yang K. Renin-Angiotensin-Aldosterone System Inhibitors and Risk of Cancer: A Population-Based Cohort Study Using a Common Data Model. *Diagnostics (Basel).* 2022;12(2). Epub 20220121. doi: 10.3390/diagnostics12020263. PubMed PMID: 35204354; PubMed Central PMCID: PMC8871518.
416. Pfaff ER, Haendel MA, Kostka K, Lee A, Niehaus E, Palchuk MB, Walters K, Chute CG. Ensuring a safe(r) harbor: Excising personally identifiable information from structured electronic health record data. *J Clin Transl Sci.* 2022;6(1):e10. Epub 20211209. doi: 10.1017/cts.2021.880. PubMed PMID: 35211336; PubMed Central PMCID: PMC8826001.
417. Lee KA, Jin HY, Kim YJ, Kim SS, Cho EH, Park TS. Real-world comparison of mono and dual combination therapies of metformin, sulfonyleurea, and dipeptidyl peptidase-4 inhibitors using a common data model: A retrospective observational study. *Medicine (Baltimore).* 2022;101(8):e28823. doi: 10.1097/md.00000000000028823. PubMed PMID: 35212277; PubMed Central PMCID: PMC8878728.
418. Hunger M, Bardenheuer K, Passey A, Schade R, Sharma R, Hague C. The Value of Federated Data Networks in Oncology: What Research Questions Do They Answer? Outcomes From a Systematic Literature Review. *Value Health.* 2022;25(5):855-68. Epub 20211223. doi: 10.1016/j.jval.2021.11.1357. PubMed PMID: 35249830.
419. Jung H, Yoo S, Kim S, Heo E, Kim B, Lee HY, Hwang H. Patient-Level Fall Risk Prediction Using the Observational Medical Outcomes Partnership's Common Data Model: Pilot Feasibility Study. *JMIR Med Inform.* 2022;10(3):e35104. Epub 20220311. doi: 10.2196/35104. PubMed PMID: 35275076; PubMed Central PMCID: PMC8957002.
420. Spotnitz M, Ostropelets A, Castano VG, Natarajan K, Waldman GJ, Argenziano M, Ottman R, Hripscak G, Choi H, Youngerman BE. Patient characteristics and anti-seizure medication pathways in newly diagnosed epilepsy: Feasibility and pilot results using the common data model in a single-center electronic medical record database. *Epilepsy Behav.* 2022;129:108630. Epub 20220308. doi: 10.1016/j.yebeh.2022.108630. PubMed PMID: 35276502.
421. Byun J, Lee DY, Jeong CW, Kim Y, Rhee HY, Moon KW, Heo J, Hong Y, Kim WJ, Nam SJ, Choi HS, Park JI, Chun IK, Bak SH, Lee K, Byeon GH, Kim KL, Kim JA, Park YJ, Kim JH, Lee EJ, Lee SA, Kwon SO, Park SW, Kasani PH, Kim JK, Kim Y, Kim S, Jang JW. Analysis of treatment pattern of anti-dementia medications in newly diagnosed Alzheimer's dementia using OMOP CDM. *Sci Rep.* 2022;12(1):4451. Epub 20220315. doi: 10.1038/s41598-022-08595-1. PubMed PMID: 35292697; PubMed Central PMCID: PMC8924152.
422. Rambla J, Baudis M, Ariosa R, Beck T, Fromont LA, Navarro A, Paloots R, Rueda M, Saunders G, Singh B, Spalding JD, Törnroos J, Vasallo C, Veal CD, Brookes AJ. Beacon v2 and Beacon networks: A "lingua franca" for federated data discovery in biomedical genomics, and beyond. *Hum Mutat.* 2022;43(6):791-9. Epub 20220408. doi: 10.1002/humu.24369. PubMed PMID: 35297548; PubMed Central PMCID: PMC9322265.
423. Zhou J, Guo C, Ren L, Zhu D, Zhen W, Zhang S, Zhang Q. Gender differences in outpatients with dementia from a large psychiatric hospital in China. *BMC Psychiatry.* 2022;22(1):208. Epub 20220321. doi: 10.1186/s12888-022-03852-z. PubMed PMID: 35313835; PubMed Central PMCID: PMC8935692.
424. Lu Y, Van Zandt M, Liu Y, Li J, Wang X, Chen Y, Chen Z, Cho J, Dorajoo SR, Feng M, Hsu MH, Hsu JC, Iqbal U, Jonnagaddala J, Li YC, Liaw ST, Lim HS, Ngiam KY, Nguyen PA, Park RW, Pratt N, Reich C, Rhee SY, Sathappan SMK, Shin SJ, Tan HX, You SC, Zhang X, Krumholz HM, Suchard MA, Xu H. Analysis of Dual Combination Therapies Used in Treatment of Hypertension in a Multinational Cohort. *JAMA Netw Open.* 2022;5(3):e223877. Epub 20220301. doi: 10.1001/jamanetworkopen.2022.3877. PubMed PMID: 35323951; PubMed Central PMCID: PMC8948532.
425. Kostka K, Duarte-Salles T, Prats-Urbe A, Sena AG, Pistillo A, Khalid S, Lai LYH, Golozar A, Alshammari TM, Dawoud DM, Nyberg F, Wilcox AB, Andryc A, Williams A, Ostropelets A, Areia C, Jung CY, Harle CA, Reich CG, Blacketer C, Morales DR, Dorr DA, Burn E, Roel E, Tan EH, Minty E, DeFalco F, de Maeztu G, Lipori G, Alghoul H, Zhu H, Thomas JA, Bian J, Park J, Martínez Roldán J, Posada JD, Banda JM, Horcajada JP, Kohler J, Shah K, Natarajan K, Lynch KE, Liu L, Schilling LM, Recalde M, Spotnitz M, Gong M, Matheny ME, Valveny N, Weiskopf NG, Shah N, Alser O, Casajust P, Park RW, Schuff R, Seager S, DuVall SL, You SC, Song S, Fernández-Bertolin S, Fortin S, Magoc T, Falconer T, Subbian V, Huser V, Ahmed WU, Carter W, Guan Y, Galvan Y, He X, Rijnbeek PR, Hripscak G, Ryan PB, Suchard MA, Prieto-Alhambra D. Unraveling COVID-19: A Large-Scale Characterization of 4.5 Million COVID-19 Cases Using CHARYBDIS. *Clin Epidemiol.* 2022;14:369-84. Epub 20220322. doi: 10.2147/lep.S323292. PubMed PMID: 35345821; PubMed Central PMCID: PMC8957305.
426. Luo C, Islam MN, Sheils NE, Buresh J, Repts J, Schuemie MJ, Ryan PB, Edmondson M, Duan R, Tong J, Marks-Anglin A, Bian J, Chen Z, Duarte-Salles T, Fernández-Bertolin S, Falconer T, Kim C, Park RW, Pfohl SR, Shah NH, Williams AE, Xu H, Zhou Y, Lautenbach E, Doshi JA, Werner RM, Asch DA, Chen Y. DLMM as a lossless one-shot algorithm for collaborative multi-site distributed linear mixed models. *Nat Commun.* 2022;13(1):1678. Epub 20220330. doi: 10.1038/s41467-022-29160-4. PubMed PMID: 35354802; PubMed Central PMCID: PMC8967932.
427. Kim S, Bang JI, Boo D, Kim B, Choi IY, Ko S, Yoo IR, Kim K, Kim J, Joo Y, Ryoo HG, Paeng JC, Park JM, Jang W, Kim B, Chung Y, Yang D, Yoo S, Lee HY. Second primary malignancy risk in thyroid cancer and matched patients with and without radioiodine therapy analysis from the observational health data sciences and informatics. *Eur J Nucl Med Mol Imaging.* 2022;49(10):3547-56. Epub 20220401. doi: 10.1007/s00259-022-05779-9. PubMed PMID: 35362796.
428. Kim TH, Noh S, Kim YR, Lee C, Kim JE, Jeong CW, Yoon KH. Development and validation of a management system and dataset quality assessment tool for the Radiology Common Data Model (R_CDM): A case study in liver disease. *Int J Med Inform.* 2022;162:104759. Epub 20220401. doi: 10.1016/j.ijmedinf.2022.104759. PubMed PMID: 35390589.
429. Lai LY, Arshad F, Areia C, Alshammari TM, Alghoul H, Casajust P, Li X, Dawoud D, Nyberg F, Pratt N, Hripscak G, Suchard MA, Prieto-Alhambra D, Ryan P, Schuemie MJ. Current Approaches to Vaccine Safety Using Observational Data: A Rationale for the EUMAEUS (Evaluating Use of Methods for Adverse Events Under Surveillance-for Vaccines) Study Design. *Front Pharmacol.* 2022;13:837632. Epub 20220322. doi: 10.3389/fphar.2022.837632. PubMed PMID: 35392566; PubMed Central PMCID: PMC8980923.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thu Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

430. Raventós B, Pistillo A, Reyes C, Fernández-Bertolin S, Aragón M, Berenguera A, Jacques-Aviñó C, Medina-Perucha L, Burn E, Duarte-Salles T. Impact of the COVID-19 pandemic on diagnoses of common mental health disorders in adults in Catalonia, Spain: a population-based cohort study. *BMJ Open*. 2022;12(4):e057866. Epub 20220408. doi: 10.1136/bmjopen-2021-057866. PubMed PMID: 35396302; PubMed Central PMCID: PMC8995576.
431. Quiroz JC, Chard T, Sa Z, Ritchie A, Jorm L, Gallego B. Extract, transform, load framework for the conversion of health databases to OMOP. *PLoS One*. 2022;17(4):e0266911. Epub 20220411. doi: 10.1371/journal.pone.0266911. PubMed PMID: 35404974; PubMed Central PMCID: PMC9000122.
432. Fang Y, Ildhay B, Sun Y, Liu H, Chen Z, Marder K, Xu H, Schnall R, Weng C. Combining human and machine intelligence for clinical trial eligibility querying. *J Am Med Inform Assoc*. 2022;29(7):1161-71. doi: 10.1093/jamia/ocac051. PubMed PMID: 35426943; PubMed Central PMCID: PMC9196697.
433. John LH, Kors JA, Reys JM, Ryan PB, Rijnbeek PR. Logistic regression models for patient-level prediction based on massive observational data: Do we need all data? *Int J Med Inform*. 2022;163:104762. Epub 20220412. doi: 10.1016/j.ijmedinf.2022.104762. PubMed PMID: 35429722.
434. Bradwell KR, Wooldridge JT, Amor B, Bennett TD, Anand A, Bremer C, Yoo YJ, Qian Z, Johnson SG, Pfaff ER, Girvin AT, Manna A, Niehaus EA, Hong SS, Zhang XT, Zhu RL, Bissell M, Qureshi N, Saltz J, Haendel MA, Chute CG, Lehmann HP, Moffitt RA. Harmonizing units and values of quantitative data elements in a very large nationally pooled electronic health record (EHR) dataset. *J Am Med Inform Assoc*. 2022;29(7):1172-82. doi: 10.1093/jamia/ocac054. PubMed PMID: 35435957; PubMed Central PMCID: PMC9196692.
435. Bardenheuer K, Van Speybroeck M, Hague C, Nikai E, Price M. Haematology Outcomes Network in Europe (HONEUR)-A collaborative, interdisciplinary platform to harness the potential of real-world data in hematology. *Eur J Haematol*. 2022;109(2):138-45. Epub 20220514. doi: 10.1111/ejh.13780. PubMed PMID: 35460296.
436. Seinen TM, Fridgeirsson EA, Ioannou S, Jeannotot D, John LH, Kors JA, Markus AF, Pera V, Rekkas A, Williams RD, Yang C, van Mulligen EM, Rijnbeek PR. Use of unstructured text in prognostic clinical prediction models: a systematic review. *J Am Med Inform Assoc*. 2022;29(7):1292-302. doi: 10.1093/jamia/ocac058. PubMed PMID: 35475536; PubMed Central PMCID: PMC9196702.
437. Ostropolets A, Ryan PB, Schuemie MJ, Hripcsak G. Characterizing Anchoring Bias in Vaccine Comparator Selection Due to Health Care Utilization With COVID-19 and Influenza: Observational Cohort Study. *JMIR Public Health Surveill*. 2022;8(6):e33099. Epub 20220617. doi: 10.2196/33099. PubMed PMID: 35482996; PubMed Central PMCID: PMC9250064.
438. Naranjo A, Prieto-Alhambra D, Sánchez-Martín J, Pérez-Mitru A, Brosa M. Cost-Effectiveness Analysis of Fracture Liaison Services Compared with Standard of Care in the Secondary Prevention of Fragility Fractures in Spain. *Clinicoecon Outcomes Res*. 2022;14:249-64. Epub 20220422. doi: 10.2147/ceor.S350790. PubMed PMID: 35492806; PubMed Central PMCID: PMC9041144.
439. Amrollahi F, Shashikumar SP, Meier A, Ohno-Machado L, Nemati S, Wardi G. Inclusion of social determinants of health improves sepsis readmission prediction models. *J Am Med Inform Assoc*. 2022;29(7):1263-70. doi: 10.1093/jamia/ocac060. PubMed PMID: 35511233; PubMed Central PMCID: PMC9196687.
440. Ostropolets A, Li X, Makadia R, Rao G, Rijnbeek PR, Duarte-Salles T, Sena AG, Shaoibi A, Suchard MA, Ryan PB, Prieto-Alhambra D, Hripcsak G. Factors Influencing Background Incidence Rate Calculation: Systematic Empirical Evaluation Across an International Network of Observational Databases. *Front Pharmacol*. 2022;13:814198. Epub 20220426. doi: 10.3389/fphar.2022.814198. PubMed PMID: 35559254; PubMed Central PMCID: PMC9087898.
441. Reese JT, Coleman B, Chan L, Blau H, Callahan TJ, Cappelletti L, Fontana T, Bradwell KR, Harris NL, Casiraghi E, Valentini G, Karlebach G, Deer R, McMurry JA, Haendel MA, Chute CG, Pfaff E, Moffitt R, Spratt H, Singh JA, Mungall CJ, Williams AE, Robinson PN. NSAID use and clinical outcomes in COVID-19 patients: a 38-center retrospective cohort study. *Virology*. 2022;19(1):84. Epub 20220515. doi: 10.1186/s12985-022-01813-2. PubMed PMID: 35570298; PubMed Central PMCID: PMC9107579.
442. Yi W, Kim BH, Kim M, Kim J, Im M, Ryang S, Kim EH, Jeon YK, Kim SS, Kim IJ. Heart Failure and Stroke Risks in Users of Liothyronine With or Without Levothyroxine Compared with Levothyroxine Alone: A Propensity Score-Matched Analysis. *Thyroid*. 2022;32(7):764-71. Epub 20220607. doi: 10.1089/thy.2021.0634. PubMed PMID: 35570696.
443. Künnapuu K, Ioannou S, Ligi K, Kolde R, Laur S, Vilo J, Rijnbeek PR, Reisberg S. Trajectories: a framework for detecting temporal clinical event sequences from health data standardized to the Observational Medical Outcomes Partnership (OMOP) Common Data Model. *JAMIA Open*. 2022;5(1):oac021. Epub 20220316. doi: 10.1093/jamia-open/oac021. PubMed PMID: 35571357; PubMed Central PMCID: PMC9097714.
444. Burn E, Duarte-Salles T, Fernandez-Bertolin S, Reyes C, Kostka K, Delmestri A, Rijnbeek P, Verhamme K, Prieto-Alhambra D. Venous or arterial thrombosis and deaths among COVID-19 cases: a European network cohort study. *Lancet Infect Dis*. 2022;22(8):1142-52. Epub 20220513. doi: 10.1016/s1473-3099(22)00223-7. PubMed PMID: 35576963; PubMed Central PMCID: PMC9106320.
445. Tan HX, Teo DCH, Lee D, Kim C, Neo JW, Sung C, Chahed H, Ang PS, Tan DSY, Park RW, Dorajoo SR. Applying the OMOP Common Data Model to Facilitate Benefit-Risk Assessments of Medicinal Products Using Real-World Data from Singapore and South Korea. *Health Inform Res*. 2022;28(2):112-22. Epub 20220430. doi: 10.4258/hir.2022.28.2.112. PubMed PMID: 35576979; PubMed Central PMCID: PMC9117808.
446. Wong J, Prieto-Alhambra D, Rijnbeek PR, Desai RJ, Reys JM, Toh S. Applying Machine Learning in Distributed Data Networks for Pharmacoepidemiologic and Pharmacovigilance Studies: Opportunities, Challenges, and Considerations. *Drug Saf*. 2022;45(5):493-510. Epub 20220517. doi: 10.1007/s40264-022-01158-3. PubMed PMID: 35579813; PubMed Central PMCID: PMC9112258.
447. Williams RD, Reys JM, Kors JA, Ryan PB, Steyerberg E, Verhamme KM, Rijnbeek PR. Using Iterative Pairwise External Validation to Contextualize Prediction Model Performance: A Use Case Predicting 1-Year Heart Failure Risk in Patients with Diabetes Across Five Data Sources. *Drug Saf*. 2022;45(5):563-70. Epub 20220517. doi: 10.1007/s40264-022-01161-8. PubMed PMID: 35579818; PubMed Central PMCID: PMC9114056.
448. Ge J, Kim WR, Lai JC, Kwong AJ. "Beyond MELD" - Emerging strategies and technologies for improving mortality prediction, organ allocation and outcomes in liver transplantation. *J Hepatol*. 2022;76(6):1318-29. doi: 10.1016/j.jhep.2022.03.003. PubMed PMID: 35589253; PubMed Central PMCID: PMC10286631.
449. Pfaff ER, Girvin AT, Bennett TD, Bhatia A, Brooks IM, Deer RR, Dekermanjian JP, Jolley SE, Kahn MG, Kostka K, McMurry JA, Moffitt R, Walden A, Chute CG, Haendel MA. Identifying who has long COVID in the USA: a machine learning approach using N3C data. *Lancet Digit Health*. 2022;4(7):e532-e41. Epub 20220516. doi: 10.1016/s2589-7500(22)00048-6. PubMed PMID: 35589549; PubMed Central PMCID: PMC9110014.
450. Lin V, Tsouchnika A, Allakhverdiiev E, Rosen AW, Gögenur M, Clausen JSR, Bräuner KB, Walbech JS, Rijnbeek P, Drakos I, Gögenur I. Training prediction models for individual risk assessment of postoperative complications after surgery for colorectal cancer. *Tech Coloproctol*. 2022;26(8):665-75. Epub 20220520. doi: 10.1007/s10151-022-02624-x. PubMed PMID: 35593971.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
381	14	16	24	29	30	46	79	112	124	108	167

OHDSI PUBLICATIONS

451. Seo WW, Seo SI, Kim Y, Yoo JJ, Shin WG, Kim J, You SC, Park RW, Park YM, Kim KJ, Rhee SY, Park M, Jin ES, Kim SE. Impact of pitavastatin on new-onset diabetes mellitus compared to atorvastatin and rosuvastatin: a distributed network analysis of 10 real-world databases. *Cardiovasc Diabetol*. 2022;21(1):82. Epub 20220523. doi: 10.1186/s12933-022-01524-6. PubMed PMID: 35606846; PubMed Central PMCID: PMC9128291.
452. Theron E, Gorse JF, Gansel X. Usability of OMOP Common Data Model for Detailed Lab Microbiology Results. *Stud Health Technol Inform*. 2022;294:292-6. doi: 10.3233/shti220461. PubMed PMID: 35612079.
453. Puttmann D, De Keizer N, Cornet R, Van Der Zwan E, Bakhshi-Raiez F. FAIRifying a Quality Registry Using OMOP CDM: Challenges and Solutions. *Stud Health Technol Inform*. 2022;294:367-71. doi: 10.3233/shti220476. PubMed PMID: 35612098.
454. Reinecke I, Kallfelz M, Sedlmayr M, Siebel J, Bathelt F. Evaluation and Challenges of Medical Procedure Data Harmonization to SNOMED-CT for Observational Research. *Stud Health Technol Inform*. 2022;294:405-6. doi: 10.3233/shti220484. PubMed PMID: 35612106.
455. Henke E, Reinecke I, Zoch M, Sedlmayr M, Bathelt F. Towards the Improvement of Clinical Guidelines Based on Real World Data. *Stud Health Technol Inform*. 2022;294:480-4. doi: 10.3233/shti220505. PubMed PMID: 35612126.
456. Reys JM, Williams RD, Schuemie MJ, Ryan PB, Rijnbeek PR. Learning patient-level prediction models across multiple healthcare databases: evaluation of ensembles for increasing model transportability. *BMC Med Inform Decis Mak*. 2022;22(1):142. Epub 20220525. doi: 10.1186/s12911-022-01879-6. PubMed PMID: 35614485; PubMed Central PMCID: PMC9134686.
457. Bathelt F, Reinecke I, Peng Y, Henke E, Weidner J, Bartos M, Gött R, Waltemath D, Engelmann K, Schwarz PE, Sedlmayr M. Opportunities of Digital Infrastructures for Disease Management-Exemplified on COVID-19-Related Change in Diagnosis Counts for Diabetes-Related Eye Diseases. *Nutrients*. 2022;14(10). Epub 20220511. doi: 10.3390/nu14102016. PubMed PMID: 35631157; PubMed Central PMCID: PMC9147678.
458. Shoabi A, Rao GA, Voss EA, Ostroplets A, Mayer MA, Ramírez-Anguita JM, Maljković F, Carević B, Horban S, Morales DR, Duarte-Salles T, Fraboulet C, Le Carrour T, Denaxas S, Papez V, John LH, Rijnbeek PR, Minty E, Alshammari TM, Makadia R, Blacketer C, DeFalco F, Sena AG, Suchard MA, Prieto-Alhambra D, Ryan PB. Phenotype Algorithms for the Identification and Characterization of Vaccine-Induced Thrombotic Thrombocytopenia in Real World Data: A Multinational Network Cohort Study. *Drug Saf*. 2022;45(6):685-98. Epub 20220602. doi: 10.1007/s40264-022-01187-y. PubMed PMID: 35653017; PubMed Central PMCID: PMC9160850.
459. Buy M, Digan W, Chen X, Husson J, Ménager M, Rieux-Laucat F, Garcelon N. A Multi-Omics Common Data Model for Primary Immunodeficiencies. *Stud Health Technol Inform*. 2022;290:56-60. doi: 10.3233/shti220031. PubMed PMID: 35672970.
460. Jean-Baptiste L, Mouazer A, Sedki K, Tsopra R. Translating the Observational Medical Outcomes Partnership - Common Data Model (OMOP-CDM) Electronic Health Records to an OWL Ontology. *Stud Health Technol Inform*. 2022;290:76-80. doi: 10.3233/shti220035. PubMed PMID: 35672974.
461. Heider PM, Pipaliya RM, Meystre SM. A Natural Language Processing Tool Offering Data Extraction for COVID-19 Related Information (DECOVRI). *Stud Health Technol Inform*. 2022;290:1062-3. doi: 10.3233/shti220268. PubMed PMID: 35673206.
462. Khera R, Schuemie MJ, Lu Y, Ostroplets A, Chen R, Hripcsak G, Ryan PB, Krumholz HM, Suchard MA. Large-scale evidence generation and evaluation across a network of databases for type 2 diabetes mellitus (LEGEND-T2DM): a protocol for a series of multinational, real-world comparative cardiovascular effectiveness and safety studies. *BMJ Open*. 2022;12(6):e057977. Epub 20220609. doi: 10.1136/bmjopen-2021-057977. PubMed PMID: 35680274; PubMed Central PMCID: PMC9185490.
463. Vora P, Morgan Stewart H, Russell B, Asimwe A, Brobert G. Time Trends and Treatment Pathways in Prescribing Individual Oral Anticoagulants in Patients with Nonvalvular Atrial Fibrillation: An Observational Study of More than Three Million Patients from Europe and the United States. *Int J Clin Pract*. 2022;2022:6707985. Epub 20220131. doi: 10.1155/2022/6707985. PubMed PMID: 35685531; PubMed Central PMCID: PMC9159118.
464. Tong J, Luo C, Islam MN, Sheils NE, Buresh J, Edmondson M, Merkel PA, Lautenbach E, Duan R, Chen Y. Distributed learning for heterogeneous clinical data with application to integrating COVID-19 data across 230 sites. *NPJ Digit Med*. 2022;5(1):76. Epub 20220614. doi: 10.1038/s41746-022-00615-8. PubMed PMID: 35701668; PubMed Central PMCID: PMC9198031.
465. Yoo S, Yoon E, Boo D, Kim B, Kim S, Paeng JC, Yoo IR, Choi IY, Kim K, Ryou HG, Lee SJ, Song E, Joo YH, Kim J, Lee HY. Transforming Thyroid Cancer Diagnosis and Staging Information from Unstructured Reports to the Observational Medical Outcome Partnership Common Data Model. *Appl Clin Inform*. 2022;13(3):521-31. Epub 20220615. doi: 10.1055/s-0042-1748144. PubMed PMID: 35705182; PubMed Central PMCID: PMC9200482.
466. Mun Y, Park C, Lee DY, Kim TM, Jin KW, Kim S, Chung YR, Lee K, Song JH, Roh YJ, Jee D, Kwon JW, Woo SJ, Park KH, Park RW, Yoo S, Chang DJ, Park SJ. Real-world treatment intensities and pathways of macular edema following retinal vein occlusion in Korea from Common Data Model in ophthalmology. *Sci Rep*. 2022;12(1):10162. Epub 20220617. doi: 10.1038/s41598-022-14386-5. PubMed PMID: 35715561; PubMed Central PMCID: PMC9205933.
467. Yang C, Williams RD, Swerdel JN, Almeida JR, Brouwer ES, Burn E, Carmona L, Chatzidionysiou K, Duarte-Salles T, Fakhouri W, Hottgenroth A, Jani M, Kolde R, Kors JA, Kullamaa L, Lane J, Marinier K, Michel A, Stewart HM, Prats-Urbe A, Reisberg S, Sena AG, Torre CO, Verhamme K, Vizcaya D, Weaver J, Ryan P, Prieto-Alhambra D, Rijnbeek PR. Development and external validation of prediction models for adverse health outcomes in rheumatoid arthritis: A multinational real-world cohort analysis. *Semin Arthritis Rheum*. 2022;56:152050. Epub 20220615. doi: 10.1016/j.semarthrit.2022.152050. PubMed PMID: 35728447.
468. Giangreco NP, Tatonetti NP. A database of pediatric drug effects to evaluate ontogenic mechanisms from child growth and development. *Med*. 2022;3(8):579-95.e7. Epub 20220624. doi: 10.1016/j.medj.2022.06.001. PubMed PMID: 35752163; PubMed Central PMCID: PMC9378670.
469. Xie J, Strauss VY, Collins GS, Khalid S, Delmestri A, Turkiewicz A, Englund M, Tadrus M, Reyes C, Prieto-Alhambra D. Trends of Dispensed Opioids in Catalonia, Spain, 2007-19: A Population-Based Cohort Study of Over 5 Million Individuals. *Front Pharmacol*. 2022;13:912361. Epub 20220608. doi: 10.3389/fphar.2022.912361. PubMed PMID: 35754470; PubMed Central PMCID: PMC9213744.
470. Saborit-Torres JM, Nadal-Almela S, Montell-Serrano JA, Oliver-García E, Carceller H, Gómez-Ádrian JA, Caparrós-Redondo M, García-García F, Domenech-Fernández J, De La Iglesia-Vayá M. Beyond the Brain: MIDS Extends BIDS to Multiple Modalities and Anatomical Regions. *Stud Health Technol Inform*. 2022;295:116-7. doi: 10.3233/shti220674. PubMed PMID: 35773820.
471. Reinecke I, Gruhl M, Pinnau M, Altun FB, Folz M, Zoch M, Bathelt F, Sedlmayr M. An OHDSI ATLAS Extension to Support Feasibility Requests in a Research Network. *Stud Health Technol Inform*. 2022;295:515-6. doi: 10.3233/shti220778. PubMed PMID: 35773924.
472. Molinaro A, DeFalco F. Empirical assessment of alternative methods for identifying seasonality in observational healthcare data. *BMC Med Res Methodol*. 2022;22(1):182. Epub 20220702. doi: 10.1186/s12874-022-01652-3. PubMed PMID: 35780114; PubMed Central PMCID: PMC9250712.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

473. Delanerolle G, Williams R, Stipancic A, Byford R, Forbes A, Tsang RSM, Anand SN, Bradley D, Murphy S, Akbari A, Bedston S, Lyons RA, Owen R, Torabi F, Beggs J, Chuter A, Balharry D, Joy M, Sheikh A, Hobbs FDR, de Lusignan S. Methodological Issues in Using a Common Data Model of COVID-19 Vaccine Uptake and Important Adverse Events of Interest: Feasibility Study of Data and Connectivity COVID-19 Vaccines Pharmacovigilance in the United Kingdom. *JMIR Form Res.* 2022;6(8):e37821. Epub 20220822. doi: 10.2196/37821. PubMed PMID: 35786634; PubMed Central PMCID: PMC9400842.

474. Tak YW, You SC, Han JH, Kim SS, Kim GT, Lee Y. Perceived Risk of Re-Identification in OMOP-CDM Database: A Cross-Sectional Survey. *J Korean Med Sci.* 2022;37(26):e205. Epub 20220704. doi: 10.3346/jkms.2022.37.e205. PubMed PMID: 35790207; PubMed Central PMCID: PMC9259248.

475. Voss EA, Ali SR, Singh A, Rijnbeek PR, Schuemie MJ, Fife D. Hip Fracture Risk After Treatment with Tramadol or Codeine: An Observational Study. *Drug Saf.* 2022;45(7):791-807. Epub 20220709. doi: 10.1007/s40264-022-01198-9. PubMed PMID: 35810265; PubMed Central PMCID: PMC9296392.

476. Bräuner KB, Rosen AW, Tsouchnika A, Walbech JS, Gøgenur M, Lin VA, Clausen JSR, Gøgenur I. Developing prediction models for short-term mortality after surgery for colorectal cancer using a Danish national quality assurance database. *Int J Colorectal Dis.* 2022;37(8):1835-43. Epub 20220718. doi: 10.1007/s00384-022-04207-6. PubMed PMID: 35849195.

477. Vorisek CN, Lehne M, Klopfenstein SAI, Mayer PJ, Bartschke A, Haese T, Thun S. Fast Healthcare Interoperability Resources (FHIR) for Interoperability in Health Research: Systematic Review. *JMIR Med Inform.* 2022;10(7):e35724. Epub 20220719. doi: 10.2196/35724. PubMed PMID: 35852842; PubMed Central PMCID: PMC9346559.

478. Phuong J, Hong S, Palchuk MB, Espinoza J, Meeker D, Dorr DA, Lozinski G, Madlock-Brown C, Adams WG. Advancing Interoperability of Patient-level Social Determinants of Health Data to Support COVID-19 Research. *AMIA Jt Summits Transl Sci Proc.* 2022;2022:396-405. Epub 20220523. PubMed PMID: 35854720; PubMed Central PMCID: PMC9285174.

479. Schuemie MJ, Arshad F, Pratt N, Nyberg F, Alshammari TM, Hripcsak G, Ryan P, Prieto-Alhambra D, Lai LYH, Li X, Fortin S, Minty E, Suchard MA. Vaccine Safety Surveillance Using Routinely Collected Healthcare Data-An Empirical Evaluation of Epidemiological Designs. *Front Pharmacol.* 2022;13:893484. Epub 20220706. doi: 10.3389/fphar.2022.893484. PubMed PMID: 35873596; PubMed Central PMCID: PMC9299244.

480. Khodaverdi M, Price BS, Porterfield JZ, Bunnell HT, Vest MT, Anzalone AJ, Harper J, Kimble WD, Moradi H, Hendricks B, Santangelo SL, Hodder SL. An ordinal severity scale for COVID-19 retrospective studies using Electronic Health Record data. *JAMIA Open.* 2022;5(3):oac066. Epub 20220709. doi: 10.1093/jamiaopen/oac066. PubMed PMID: 35911666; PubMed Central PMCID: PMC9278199.

481. Nishimwe A, Ruranga C, Musanabaganwa C, Mugeni R, Semakula M, Nzabanita J, Kabano I, Uwimana A, Utumatwishima JN, Kabakambira JD, Uwineza A, Halvorsen L, Descamps F, Houghtaling J, Burke B, Bahati O, Bizimana C, Jansen S, Twizere C, Nkurikiyeyezu K, Birungi F, Nsanzimana S, Twagirumukiza M. Leveraging artificial intelligence and data science techniques in harmonizing, sharing, accessing and analyzing SARS-COV-2/COVID-19 data in Rwanda (LAISDAR Project): study design and rationale. *BMC Med Inform Decis Mak.* 2022;22(1):214. Epub 20220812. doi: 10.1186/s12911-022-01965-9. PubMed PMID: 35962355; PubMed Central PMCID: PMC9372951.

482. Shah SC, Canakis A, Halvorson AE, Dorn C, Wilson O, Denton J, Hauger R, Hunt C, Suzuki A, Matheny ME, Siew E, Hung A, Greevy RA, Jr., Roumie CL. Associations Between Gastrointestinal Symptoms and COVID-19 Severity Outcomes Based on a Propensity Score-Weighted Analysis of a Nationwide Cohort. *Gastro Hep Adv.* 2022;1(6):977-84. Epub 20220807. doi: 10.1016/j.gastha.2022.06.015. PubMed PMID: 35966642; PubMed Central PMCID: PMC9357443.

483. Swerdel JN, Schuemie M, Murray G, Ryan PB. PheValuator 2.0: Methodological improvements for the PheValuator approach to semi-automated phenotype algorithm evaluation. *J Biomed Inform.* 2022;135:104177. Epub 20220819. doi: 10.1016/j.jbi.2022.104177. PubMed PMID: 35995107.

484. Liu C, Ta CN, Havrilla JM, Nestor JG, Spotnitz ME, Geneslaw AS, Hu Y, Chung WK, Wang K, Weng C. OARD: Open annotations for rare diseases and their phenotypes based on real-world data. *Am J Hum Genet.* 2022;109(9):1591-604. Epub 20220822. doi: 10.1016/j.ajhg.2022.08.002. PubMed PMID: 35998640; PubMed Central PMCID: PMC9502051.

485. Ostropelets A, Hripcsak G. COVID-19 vaccination effectiveness rates by week and sources of bias: a retrospective cohort study. *BMJ Open.* 2022;12(8):e061126. Epub 20220823. doi: 10.1136/bmjopen-2022-061126. PubMed PMID: 35998962; PubMed Central PMCID: PMC9402447.

486. Abeysinghe R, Black A, Kaduk D, Li Y, Reich C, Davydov A, Yao L, Cui L. Towards quality improvement of vaccine concept mappings in the OMOP vocabulary with a semi-automated method. *J Biomed Inform.* 2022;134:104162. Epub 20220825. doi: 10.1016/j.jbi.2022.104162. PubMed PMID: 36029954; PubMed Central PMCID: PMC9940475.

487. Català M, Coma E, Alonso S, Andrés C, Blanco I, Antón A, Bordoy AE, Cardona PJ, Fina F, Martró E, Medina M, Mora N, Saludes V, Prats C, Prieto-Alhambra D, Alvarez-Lacalle E. Transmissibility, hospitalization, and intensive care admissions due to omicron compared to delta variants of SARS-CoV-2 in Catalonia: A cohort study and ecological analysis. *Front Public Health.* 2022;10:961030. Epub 20220812. doi: 10.3389/fpubh.2022.961030. PubMed PMID: 36033822; PubMed Central PMCID: PMC9412031.

488. Almeida JR, Barraca JP, Oliveira JL. Preserving Privacy when Querying OMOP CDM Databases. *Stud Health Technol Inform.* 2022;298:163-4. doi: 10.3233/shti220930. PubMed PMID: 36073478.

489. Markos AF, Verhamme KMC, Kors JA, Rijnbeek PR. TreatmentPatterns: An R package to facilitate the standardized development and analysis of treatment patterns across disease domains. *Comput Methods Programs Biomed.* 2022;225:107081. Epub 20220821. doi: 10.1016/j.cmpb.2022.107081. PubMed PMID: 36084453.

490. Marteau BL, Zhu Y, Giuste F, Shi W, Carpenter A, Hilton C, Wang MD. Accelerating Multi-site Health Informatics with Streamlined Data Infrastructure using OMOP-on-FHIR. *Annu Int Conf IEEE Eng Med Biol Soc.* 2022;2022:4687-90. doi: 10.1109/embc48229.2022.9871865. PubMed PMID: 36085809.

491. Xiao G, Pfaff E, Prud'hommeaux E, Booth D, Sharma DK, Huo N, Yu Y, Zong N, Ruddy KJ, Chute CG, Jiang G. FHIR-Ontop-OMOP: Building clinical knowledge graphs in FHIR RDF with the OMOP Common data Model. *J Biomed Inform.* 2022;134:104201. Epub 20220909. doi: 10.1016/j.jbi.2022.104201. PubMed PMID: 36089199; PubMed Central PMCID: PMC9561043.

492. Castano VG, Spotnitz M, Waldman GJ, Joiner EF, Choi H, Ostropelets A, Natarajan K, McKhann GM, Ottman R, Neugut AI, Hripcsak G, Youngerman BE. Identification of patients with drug-resistant epilepsy in electronic medical record data using the Observational Medical Outcomes Partnership Common Data Model. *Epilepsia.* 2022;63(11):2981-93. Epub 20220930. doi: 10.1111/epi.17409. PubMed PMID: 36106377.

493. Zhang L, Wang Y, Schuemie MJ, Blei DM, Hripcsak G. Adjusting for indirectly measured confounding using large-scale propensity score. *J Biomed Inform.* 2022;134:104204. Epub 20220913. doi: 10.1016/j.jbi.2022.104204. PubMed PMID: 36108816; PubMed Central PMCID: PMC9692203.

494. Wang S, Lin M, Ding Y, Shih G, Lu Z, Peng Y. Radiology Text Analysis System (RadText): Architecture and Evaluation. *Proc (IEEE Int Conf Healthc Inform).* 2022;2022:288-96. Epub 20220908. doi: 10.1109/ichi54592.2022.00050. PubMed PMID: 36128510; PubMed Central PMCID: PMC9484781.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	108	167

OHDSI PUBLICATIONS

495. Choi S, Joo HJ, Kim Y, Kim JH, Seok J. Conversion of Automated 12-Lead Electrocardiogram Interpretations to OMOP CDM Vocabulary. *Appl Clin Inform.* 2022;13(4):880-90. Epub 20220921. doi: 10.1055/s-0042-1756427. PubMed PMID: 36130711; PubMed Central PMCID: PMC9492322.
496. Nishimura A, Xie J, Kostka K, Duarte-Salles T, Fernández Bertolin S, Aragón M, Blacketer C, Shoaibi A, DuVall SL, Lynch K, Matheny ME, Falconer T, Morales DR, Conover MM, Chan You S, Pratt N, Weaver J, Sena AG, Schuemie MJ, Reps J, Reich C, Rijnbeek PR, Ryan PB, Hripcsak G, Prieto-Alhambra D, Suchard MA. International cohort study indicates no association between alpha-1 blockers and susceptibility to COVID-19 in benign prostatic hyperplasia patients. *Front Pharmacol.* 2022;13:945592. Epub 20220914. doi: 10.3389/fphar.2022.945592. PubMed PMID: 36188566; PubMed Central PMCID: PMC9518954.
497. Fortin SP, Reps J, Ryan P. Adaptation and validation of a coding algorithm for the Charlson Comorbidity Index in administrative claims data using the SNOMED CT standardized vocabulary. *BMC Med Inform Decis Mak.* 2022;22(1):261. Epub 20221007. doi: 10.1186/s12911-022-02006-1. PubMed PMID: 36207711; PubMed Central PMCID: PMC9541054.
498. Papez V, Moinat M, Voss EA, Bazakou S, Van Winzum A, Peviani A, Payralbe S, Kallfelz M, Asselbergs FW, Prieto-Alhambra D, Dobson RJB, Denaxas S. Transforming and evaluating the UK Biobank to the OMOP Common Data Model for COVID-19 research and beyond. *J Am Med Inform Assoc.* 2022;30(1):103-11. doi: 10.1093/jamia/ocac203. PubMed PMID: 36227072; PubMed Central PMCID: PMC9619789.
499. Bae WK, Cho J, Kim S, Kim B, Baek H, Song W, Yoo S. Coronary Artery Computed Tomography Angiography for Preventing Cardio-Cerebrovascular Disease: Observational Cohort Study Using the Observational Health Data Sciences and Informatics' Common Data Model. *JMIR Med Inform.* 2022;10(10):e41503. Epub 20221013. doi: 10.2196/41503. PubMed PMID: 36227638; PubMed Central PMCID: PMC9614618.
500. Ahmadi N, Peng Y, Wolfien M, Zoch M, Sedlmayr M. OMOP CDM Can Facilitate Data-Driven Studies for Cancer Prediction: A Systematic Review. *Int J Mol Sci.* 2022;23(19). Epub 20221005. doi: 10.3390/ijms231911834. PubMed PMID: 36233137; PubMed Central PMCID: PMC9569469.
501. Lamer A, Fruchart M, Paris N, Popoff B, Payen A, Balcaen T, Gacquer W, Bouzillé G, Cuggia M, Doutreligne M, Chazard E. Standardized Description of the Feature Extraction Process to Transform Raw Data Into Meaningful Information for Enhancing Data Reuse: Consensus Study. *JMIR Med Inform.* 2022;10(10):e38936. Epub 20221017. doi: 10.2196/38936. PubMed PMID: 36251369; PubMed Central PMCID: PMC9623460.
502. Liu H, Carini S, Chen Z, Phillips Hey S, Sim I, Weng C. Ontology-based categorization of clinical studies by their conditions. *J Biomed Inform.* 2022;135:104235. Epub 20221023. doi: 10.1016/j.jbi.2022.104235. PubMed PMID: 36283581.
503. Li X, Burn E, Duarte-Salles T, Yin C, Reich C, Delmestri A, Verhamme K, Rijnbeek P, Suchard MA, Li K, Mosseveld M, John LH, Mayer MA, Ramirez-Anguita JM, Cohet C, Strauss V, Prieto-Alhambra D. Comparative risk of thrombosis with thrombocytopenia syndrome or thromboembolic events associated with different covid-19 vaccines: international network cohort study from five European countries and the US. *Bmj.* 2022;379:e071594. Epub 20221026. doi: 10.1136/bmj-2022-071594. PubMed PMID: 36288813; PubMed Central PMCID: PMC9597610.
504. Wegner P, Jose GM, Lage-Rupprecht V, Golriz Khatami S, Zhang B, Springstube S, Jacobs M, Linden T, Ku C, Schultz B, Hofmann-Apitius M, Kodamullil AT. Common data model for COVID-19 datasets. *Bioinformatics.* 2022;38(24):5466-8. doi: 10.1093/bioinformatics/btac651. PubMed PMID: 36303318; PubMed Central PMCID: PMC9750115.
505. Bönisch C, Kesztyüs D, Kesztyüs T. Harvesting metadata in clinical care: a crosswalk between FHIR, OMOP, CDISC and openEHR metadata. *Sci Data.* 2022;9(1):659. Epub 20221028. doi: 10.1038/s41597-022-01792-7. PubMed PMID: 36307424; PubMed Central PMCID: PMC9616884.
506. Lyu T, Liang C, Liu J, Campbell B, Hung P, Shih YW, Ghumman N, Li X. Temporal Events Detector for Pregnancy Care (TED-PC): A rule-based algorithm to infer gestational age and delivery date from electronic health records of pregnant women with and without COVID-19. *PLoS One.* 2022;17(10):e0276923. Epub 20221031. doi: 10.1371/journal.pone.0276923. PubMed PMID: 36315520; PubMed Central PMCID: PMC9621451.
507. Jefferson E, Cole C, Mumtaz S, Cox S, Giles TC, Adejumo S, Urwin E, Lea D, Macdonald C, Best J, Masood E, Milligan G, Johnston J, Horban S, Birced I, Hall C, Jackson AS, Collins C, Rising S, Dodsley C, Hampton J, Hadfield A, Santos R, Tarr S, Panagi V, Lavagna J, Jackson T, Chuter A, Beggs J, Martinez-Queipo M, Ward H, von Ziegenweid J, Burns F, Martin J, Sebire N, Morris C, Bradley D, Baxter R, Ahonen-Bishop A, Smith P, Shoemark A, Valdes AM, Ollivere B, Manisty C, Eyre D, Gallant S, Joy G, McAuley A, Connell D, Northstone K, Jeffery K, Di Angelantonio E, McMahon A, Walker M, Semple MG, Sims JM, Lawrence E, Davies B, Baillie JK, Tang M, Leeming G, Power L, Breeze T, Murray D, Orton C, Pierce I, Hall I, Ladhani S, Gillson N, Whitaker M, Shallcross L, Seymour D, Varma S, Reilly G, Morris A, Hopkins S, Sheikh A, Quinlan P. A Hybrid Architecture (CO-CONNECT) to Facilitate Rapid Discovery and Access to Data Across the United Kingdom in Response to the COVID-19 Pandemic: Development Study. *J Med Internet Res.* 2022;24(12):e40035. Epub 20221227. doi: 10.2196/40035. PubMed PMID: 36322788; PubMed Central PMCID: PMC9822177.
508. Wang X, Rao W, Chen X, Zhang X, Wang Z, Ma X, Zhang Q. The sociodemographic characteristics and clinical features of the late-life depression patients: results from the Beijing Anding Hospital mental health big data platform. *BMC Psychiatry.* 2022;22(1):677. Epub 20221102. doi: 10.1186/s12888-022-04339-7. PubMed PMID: 36324116; PubMed Central PMCID: PMC9628045.
509. Kim Y, Seo SI, Lee KJ, Kim J, Yoo JJ, Seo WW, Lee HS, Shin WG. 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. *Ther Adv Neurol Disord.* 2022;15:17562864221135700. Epub 20221108. doi: 10.1177/17562864221135700. PubMed PMID: 36389281; PubMed Central PMCID: PMC9647297.
510. Hughes N, Rijnbeek PR, van Bochove K, Duarte-Salles T, Steinbeisser C, Vizcaya D, Prieto-Alhambra D, Ryan P. Evaluating a novel approach to stimulate open science collaborations: a case series of "study-a-thon" events within the OHDSI and European IMI communities. *JAMIA Open.* 2022;5(4):ooac100. Epub 20221117. doi: 10.1093/jamiaopen/ooac100. PubMed PMID: 36406796; PubMed Central PMCID: PMC9670330.
511. John LH, Kors JA, Fridgeirsson EA, Reps JM, Rijnbeek PR. External validation of existing dementia prediction models on observational health data. *BMC Med Res Methodol.* 2022;22(1):311. Epub 20221205. doi: 10.1186/s12874-022-01793-5. PubMed PMID: 36471238; PubMed Central PMCID: PMC9720950.
512. Dell'Isola A, Turkiewicz A, Zhang W, Kiadaliri A, Bierma-Zeinstra S, Runhaar J, Prieto-Alhambra D, Englund M. Does osteoarthritis modify the association between NSAID use and risk of comorbidities and adverse events? *Osteoarthr Cartil Open.* 2022;4(2):100253. Epub 20220303. doi: 10.1016/j.jcarto.2022.100253. PubMed PMID: 36475285; PubMed Central PMCID: PMC9718100.
513. You SC, Lee S, Choi B, Park RW. Establishment of an International Evidence Sharing Network Through Common Data Model for Cardiovascular Research. *Korean Circ J.* 2022;52(12):853-64. doi: 10.4070/kcj.2022.0294. PubMed PMID: 36478647; PubMed Central PMCID: PMC9742390.
514. Cheng X, Cheng M, Yu L, Xiao X. iADRGSE: A Graph-Embedding and Self-Attention Encoding for Identifying Adverse Drug Reaction in the Earlier Phase of Drug Development. *Int J Mol Sci.* 2022;23(24). Epub 20221219. doi: 10.3390/ijms232416216. PubMed PMID: 36555858; PubMed Central PMCID: PMC9786008.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

515. Moreno-Martos D, Verhamme K, Ostropolets A, Kostka K, Duarte-Sales T, Prieto-Alhambra D, Alshammari TM, Alghoul H, Ahmed WU, Blacketer C, DuVall S, Lai L, Matheny M, Nyberg F, Posada J, Rijnbeek P, Spotnitz M, Sena A, Shah N, Suchard M, Chan You S, Hripcsak G, Ryan P, Morales D. Characteristics and outcomes of COVID-19 patients with COPD from the United States, South Korea, and Europe. *Wellcome Open Res.* 2022;7:22. Epub 20220324. doi: 10.12688/wellcomeopenres.17403.2. PubMed PMID: 36845321; PubMed Central PMCID: PMC9951545.
516. Ostropolets A, Ryan P, Hripcsak G. Phenotyping in distributed data networks: selecting the right codes for the right patients. *AMIA Annu Symp Proc.* 2022;2022:826-35. Epub 20230429. PubMed PMID: 37128407; PubMed Central PMCID: PMC10148372.
517. Joopudi V, Dandala B, Tsou CH, Liang JJ. Hierarchy-aware Adverse Reaction Embeddings for Signal Detection. *AMIA Annu Symp Proc.* 2022;2022:596-605. Epub 20230429. PubMed PMID: 37128452; PubMed Central PMCID: PMC10148317.
518. Jiang X, Beaton MA, Gillberg J, Williams A, Natarajan K. Feasibility of Linking Area Deprivation Index Data to the OMOP Common Data Model. *AMIA Annu Symp Proc.* 2022;2022:587-95. Epub 20230429. PubMed PMID: 37128466; PubMed Central PMCID: PMC10148322.
519. Bennett N, Plečko D, Ukör IF, Meinshausen N, Bühlmann P. ricu: R's interface to intensive care data. *Gigascience.* 2022;12. Epub 20230615. doi: 10.1093/gigascience/giad041. PubMed PMID: 37318234; PubMed Central PMCID: PMC10268223.
520. Hardin J, Murray G, Swerdel J. Phenotype Algorithms to Identify Hidradenitis Suppurativa Using Real-World Data: Development and Validation Study. *JMIR Dermatol.* 2022;5(4):e38783. Epub 20221130. doi: 10.2196/38783. PubMed PMID: 37632892; PubMed Central PMCID: PMC10334943.
521. Lamer A, Moussa MD, Marcilly R, Logier R, Vallet B, Tavernier B. Development and usage of an anesthesia data warehouse: lessons learnt from a 10-year project. *J Clin Monit Comput.* 2023;37(2):461-72. Epub 20220806. doi: 10.1007/s10877-022-00898-y. PubMed PMID: 35933465; PubMed Central PMCID: PMC10068662.
522. McCrimmon RJ, Cheng AYY, Galstyan G, Djaballah K, Li X, Coudert M, Frias JP. iGlarLixi versus basal plus Rapid-Acting insulin in adults with type 2 diabetes advancing from basal insulin therapy: The SoliSimplify Real-World study. *Diabetes Obes Metab.* 2023;25(1):68-77. Epub 20220919. doi: 10.1111/dom.14844. PubMed PMID: 36123617; PubMed Central PMCID: PMC10087837.
523. Kim Y, Seo SI, Lee KJ, Kim J, Yoo JJ, Seo WW, Shin WG. Risks of long-term use of proton pump inhibitor on ischemic vascular events: A distributed network analysis of 5 real-world observational Korean databases using a common data model. *Int J Stroke.* 2023;18(5):590-8. Epub 20221027. doi: 10.1177/17474930221133219. PubMed PMID: 36190338.
524. Kanbar LJ, Dexheimer JW, Zahner J, Burrows EK, Chatburn R, Messinger A, Baker CD, Schuler CL, Bencotter D, Amin R, Pajor N. Standardizing electronic health record ventilation data in the pediatric long-term mechanical ventilator-dependent population. *Pediatr Pulmonol.* 2023;58(2):433-40. Epub 20221020. doi: 10.1002/ppul.26204. PubMed PMID: 36226360.
525. Junior EPP, Normando P, Flores-Ortiz R, Afzal MU, Jamil MA, Bertolin SF, Oliveira VA, Martufi V, de Sousa F, Bashir A, Burn E, Ichihara MY, Barreto ML, Salles TD, Prieto-Alhambra D, Hafeez H, Khalid S. Integrating real-world data from Brazil and Pakistan into the OMOP common data model and standardized health analytics framework to characterize COVID-19 in the Global South. *J Am Med Inform Assoc.* 2023;30(4):643-55. doi: 10.1093/jamia/ocac180. PubMed PMID: 36264262; PubMed Central PMCID: PMC9619798.
526. Peng Y, Henke E, Reinecke I, Zoch M, Sedlmayr M, Bathelt F. An ETL-process design for data harmonization to participate in international research with German real-world data based on FHIR and OMOP CDM. *Int J Med Inform.* 2023;169:104925. Epub 20221110. doi: 10.1016/j.ijmedinf.2022.104925. PubMed PMID: 36395615.
527. Park KY, Kim MH, Choi SH, Pang EK. Association of periodontitis with menopause and hormone replacement therapy: a hospital cohort study using a common data model. *J Periodontol Implant Sci.* 2023;53(3):184-93. Epub 20221116. doi: 10.5051/jpis.2202480124. PubMed PMID: 36468484; PubMed Central PMCID: PMC10315258.
528. Reese JT, Blau H, Casiraghi E, Bergquist T, Loomba JJ, Callahan TJ, Laraway B, Antonescu C, Coleman B, Gargano M, Wilkins KJ, Cappelletti L, Fontana T, Ammar N, Antony B, Murali TM, Caufield JH, Karlebach G, McMurry JA, Williams A, Moffitt R, Banerjee J, Solomonides AE, Davis H, Kostka K, Valentini G, Sahner D, Chute CG, Madlock-Brown C, Haendel MA, Robinson PN. Generalisable long COVID subtypes: findings from the NIH N3C and RECOVER programmes. *EBioMedicine.* 2023;87:104413. Epub 20221221. doi: 10.1016/j.ebiom.2022.104413. PubMed PMID: 36563487; PubMed Central PMCID: PMC9769411.
529. Park K, Cho M, Song M, Yoo S, Baek H, Kim S, Kim K. Exploring the potential of OMOP common data model for process mining in healthcare. *PLoS One.* 2023;18(1):e0279641. Epub 20230103. doi: 10.1371/journal.pone.0279641. PubMed PMID: 36595527; PubMed Central PMCID: PMC9810199.
530. Yu Y, Jiang G, Brandt E, Forsyth T, Dhruva SS, Zhang S, Chen J, Noseworthy PA, Doshi AA, Collison-Farr K, Kim D, Ross JS, Coplan PM, Drozda JP, Jr. Integrating real-world data to assess cardiac ablation device outcomes in a multicenter study using the OMOP common data model for regulatory decisions: implementation and evaluation. *JAMIA Open.* 2023;6(1):ooac108. Epub 20230110. doi: 10.1093/jamiaopen/ooac108. PubMed PMID: 36632328; PubMed Central PMCID: PMC9831049.
531. Schuemie MJ, Bu F, Nishimura A, Suchard MA. Adjusting for both sequential testing and systematic error in safety surveillance using observational data: Empirical calibration and MaxSPRT. *Stat Med.* 2023;42(5):619-31. Epub 20230115. doi: 10.1002/sim.9631. PubMed PMID: 36642826; PubMed Central PMCID: PMC10107810.
532. Xie J, Brash JT, Turkmen C, Driessen S, Varrassi G, Argyriou G, Seager S, Reich C, Prieto-Alhambra D. Risk of COVID-19 Diagnosis and Hospitalisation in Patients with Osteoarthritis or Back Pain Treated with Ibuprofen Compared to Other NSAIDs or Paracetamol: A Network Cohort Study. *Drugs.* 2023;83(3):249-63. Epub 20230124. doi: 10.1007/s40265-022-01822-z. PubMed PMID: 36692805; PubMed Central PMCID: PMC9872078.
533. Luo H, Lau WCY, Chai Y, Torre CO, Howard R, Liu KY, Lin X, Yin C, Fortin S, Kern DM, Lee DY, Park RW, Jang JW, Chui CSL, Li J, Reich C, Man KKC, Wong ICK. Rates of Antipsychotic Drug Prescribing Among People Living With Dementia During the COVID-19 Pandemic. *JAMA Psychiatry.* 2023;80(3):211-9. doi: 10.1001/jamapsychiatry.2022.4448. PubMed PMID: 36696128; PubMed Central PMCID: PMC9878427.
534. Reinecke I, Siebel J, Fuhrmann S, Fischer A, Sedlmayr M, Weidner J, Bathelt F. Assessment and Improvement of Drug Data Structuredness From Electronic Health Records: Algorithm Development and Validation. *JMIR Med Inform.* 2023;11:e40312. Epub 20230125. doi: 10.2196/40312. PubMed PMID: 36696159; PubMed Central PMCID: PMC9909518.
535. Swerdel JN, Ramcharran D, Hardin J. Using a data-driven approach for the development and evaluation of phenotype algorithms for systemic lupus erythematosus. *PLoS One.* 2023;18(2):e0281929. Epub 20230216. doi: 10.1371/journal.pone.0281929. PubMed PMID: 36795690; PubMed Central PMCID: PMC9934349.
536. Kim C, Lee DY, Park J, Yang SJ, Tan EH, Alhambra DP, Lee YH, Lee S, Kim SJ, Lee J, Park RW, Shin Y. Safety outcomes of selective serotonin reuptake inhibitors in adolescent attention-deficit/hyperactivity disorder with comorbid depression: the ASSURE study. *Psychol Med.* 2023;53(10):4811-9. Epub 20230220. doi: 10.1017/S0033291723000120. PubMed PMID: 36803587.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	119	124	108	167

OHDSI PUBLICATIONS

537. Ostropelets A, Albogami Y, Conover M, Banda JM, Baumgartner WA, Blacketer C, Desai P, DuVall SL, Fortin S, Gilbert JP, Golozar A, Ide J, Kanter AS, Kern DM, Kim C, Lai LYH, Li C, Liu F, Lynch KE, Minty E, Neves MI, Ng DQ, Obene T, Pera V, Pratt N, Rao G, Rappoport N, Reinecke I, Saroufim P, Shoaibi A, Simon K, Suchard MA, Swerdel JN, Voss EA, Weaver J, Zhang L, Hripscak G, Ryan PB. Reproducible variability: assessing investigator discordance across 9 research teams attempting to reproduce the same observational study. *J Am Med Inform Assoc.* 2023;30(5):859-68. doi: 10.1093/jamia/ocad009. PubMed PMID: 36826399; PubMed Central PMCID: PMC10114120.
538. Frid S, Pastor Duran X, Bracons Cucó G, Pedrera-Jiménez M, Serrano-Balazote P, Muñoz Carrero A, Lozano-Rubí R. An Ontology-Based Approach for Consolidating Patient Data Standardized With European Norm/International Organization for Standardization 13606 (EN/ISO 13606) Into Joint Observational Medical Outcomes Partnership (OMOP) Repositories: Description of a Methodology. *JMIR Med Inform.* 2023;11:e44547. Epub 20230308. doi: 10.2196/44547. PubMed PMID: 36884279; PubMed Central PMCID: PMC10034609.
539. López-Güell K, Prats-Urbe A, Català M, Prats C, Hein J, Prieto-Alhambra D. The impact of COVID-19 certification mandates on the number of cases of and hospitalizations with COVID-19 in the UK: A difference-in-differences analysis. *Front Public Health.* 2023;11:1019223. Epub 20230224. doi: 10.3389/fpubh.2023.1019223. PubMed PMID: 36908465; PubMed Central PMCID: PMC9998475.
540. Keloth VK, Banda JM, Gurley M, Heider PM, Kennedy G, Liu H, Liu F, Miller T, Natarajan K, O VP, Peng Y, Raja K, Reeves RM, Rouhizadeh M, Shi J, Wang X, Wang Y, Wei WQ, Williams AE, Zhang R, Belenkaya R, Reich C, Blacketer C, Ryan P, Hripscak G, Elhadad N, Xu H. Representing and utilizing clinical textual data for real world studies: An OHDSI approach. *J Biomed Inform.* 2023;142:104343. Epub 20230317. doi: 10.1016/j.jbi.2023.104343. PubMed PMID: 36935011; PubMed Central PMCID: PMC10428170.
541. Ly NF, Flach C, Lysen TS, Markov E, van Ballegooijen H, Rijnbeek P, Duarte-Salles T, Reyes C, John LH, Karimi L, Reich C, Salek S, Layton D. Impact of European Union Label Changes for Fluoroquinolone-Containing Medicinal Products for Systemic and Inhalation Use: Post-Referral Prescribing Trends. *Drug Saf.* 2023;46(4):405-16. Epub 20230328. doi: 10.1007/s40264-023-01286-4. PubMed PMID: 36976448; PubMed Central PMCID: PMC10044099.
542. Park J, Lee JY, Moon MH, Park YH, Rho MJ. Cancer Research Line (CAREL): Development of Expanded Distributed Research Networks for Prostate Cancer and Lung Cancer. *Technol Cancer Res Treat.* 2023;22:15330338221149262. doi: 10.1177/15330338221149262. PubMed PMID: 36977531; PubMed Central PMCID: PMC10061631.
543. Rekkas A, van Klaveren D, Ryan PB, Steyerberg EW, Kent DM, Rijnbeek PR. A standardized framework for risk-based assessment of treatment effect heterogeneity in observational healthcare databases. *NPJ Digit Med.* 2023;6(1):58. Epub 20230330. doi: 10.1038/s41746-023-00794-y. PubMed PMID: 36991144; PubMed Central PMCID: PMC10060247.
544. Cremonesi F, Planat V, Kalokyri V, Kondylakis H, Sanavia T, Miguel Mateos Resinas V, Singh B, Uribe S. The need for multimodal health data modeling: A practical approach for a federated-learning healthcare platform. *J Biomed Inform.* 2023;141:104338. Epub 20230405. doi: 10.1016/j.jbi.2023.104338. PubMed PMID: 37023843.
545. Heavner SF, Anderson W, Kashyap R, Dasher P, Mathé EA, Merson L, Guerin PJ, Weaver J, Robinson M, Schito M, Kumar VK, Nagy P. A Path to Real-World Evidence in Critical Care Using Open-Source Data Harmonization Tools. *Crit Care Explor.* 2023;5(4):e0893. Epub 20230403. doi: 10.1097/cce.0000000000000893. PubMed PMID: 37025303; PubMed Central PMCID: PMC10072311.
546. Du M, Prats-Urbe A, Khalid S, Prieto-Alhambra D, Strauss VY. Random effects modelling versus logistic regression for the inclusion of cluster-level covariates in propensity score estimation: A Monte Carlo simulation and registry cohort analysis. *Front Pharmacol.* 2023;14:988605. Epub 20230323. doi: 10.3389/fphar.2023.988605. PubMed PMID: 37033623; PubMed Central PMCID: PMC10077146.
547. Markus AF, Strauss VY, Burn E, Li X, Delmestri A, Reich C, Yin C, Mayer MA, Ramírez-Anguita JM, Marti E, Verhamme KMC, Rijnbeek PR, Prieto-Alhambra D, Jödicke AM. Characterising the treatment of thromboembolic events after COVID-19 vaccination in 4 European countries and the US: An international network cohort study. *Front Pharmacol.* 2023;14:1118203. Epub 20230324. doi: 10.3389/fphar.2023.1118203. PubMed PMID: 37033631; PubMed Central PMCID: PMC10079887.
548. Voss EA, Shoaibi A, Yin Hui Lai L, Blacketer C, Alshammari T, Makadia R, Haynes K, Sena AG, Rao G, van Sandijk S, Fraboulet C, Boyer L, Le Carrouer T, Horban S, Morales DR, Martínez Roldán J, Ramírez-Anguita JM, Mayer MA, de Wilde M, John LH, Duarte-Salles T, Roel E, Pistillo A, Kolde R, Maljković F, Denaxas S, Papez V, Kahn MG, Natarajan K, Reich C, Secora A, Minty EP, Shah NH, Posada JD, Garcia Morales MT, Bosca D, Cadenas Juanino H, Diaz Holgado A, Pedrera Jiménez M, Serrano Balazote P, García Barrio N, Şen S, Üresin AY, Erdogan B, Belmans L, Byttebier G, Malbrain M, Dedman DJ, Cuccu Z, Vashisht R, Butte AJ, Patel A, Dahm L, Han C, Bu F, Arshad F, Ostropelets A, Nyberg F, Hripscak G, Suchard MA, Prieto-Alhambra D, Rijnbeek PR, Schuemie MJ, Ryan PB. Contextualising adverse events of special interest to characterise the baseline incidence rates in 24 million patients with COVID-19 across 26 databases: a multinational retrospective cohort study. *EClinicalMedicine.* 2023;58:101932. Epub 20230404. doi: 10.1016/j.eclinm.2023.101932. PubMed PMID: 37034358; PubMed Central PMCID: PMC10072853.
549. Meystre SM, Heider PM, Cates A, Bastian G, Pittman T, Gentilin S, Kelechi TJ. Piloting an automated clinical trial eligibility surveillance and provider alert system based on artificial intelligence and standard data models. *BMC Med Res Methodol.* 2023;23(1):88. Epub 20230411. doi: 10.1186/s12874-023-01916-6. PubMed PMID: 37041475; PubMed Central PMCID: PMC10088225.
550. Leese P, Anand A, Girvin A, Manna A, Patel S, Yoo YJ, Wong R, Haendel M, Chute CG, Bennett T, Hajagos J, Pfaff E, Moffitt R. Clinical encounter heterogeneity and methods for resolving in networked EHR data: a study from N3C and RECOVER programs. *J Am Med Inform Assoc.* 2023;30(6):1125-36. doi: 10.1093/jamia/ocad057. PubMed PMID: 37087110; PubMed Central PMCID: PMC10198518.
551. Händel MN, Cardoso I, von Bülow C, Rohde JF, Ussing A, Nielsen SM, Christensen R, Body JJ, Brandt ML, Diez-Perez A, Hadji P, Javaid MK, Lems WF, Noguez X, Roux C, Minisola S, Kurth A, Thomas T, Prieto-Alhambra D, Ferrari SL, Langdahl B, Abrahamsen B. Fracture risk reduction and safety by osteoporosis treatment compared with placebo or active comparator in postmenopausal women: systematic review, network meta-analysis, and meta-regression analysis of randomised clinical trials. *Bmj.* 2023;381:e068033. Epub 20230502. doi: 10.1136/bmj-2021-068033. PubMed PMID: 37130601; PubMed Central PMCID: PMC10152340.
552. Kempf E, Vaterkowski M, Leprovost D, Griffon N, Ouagne D, Breant S, Serre P, Mouchet A, Rance B, Chatellier G, Bellamine A, Frank M, Guerin J, Tannier X, Livartowski A, Hilka M, Daniel C. How to Improve Cancer Patients Enrollment in Clinical Trials From Real-Life Databases Using the Observational Medical Outcomes Partnership Oncology Extension: Results of the PENELOPE Initiative in Urologic Cancers. *JCO Clin Cancer Inform.* 2023;7:e2200179. doi: 10.1200/cci.22.00179. PubMed PMID: 37167578.
553. Korntheuer RL, Katsch F, Duftschmid G. Transforming Documents of the Austrian Nationwide EHR System into the OMOP CDM. *Stud Health Technol Inform.* 2023;301:54-9. doi: 10.3233/shi230011. PubMed PMID: 37172152.
554. Spotnitz M, Acharya N, Cimino JJ, Murphy S, Namjou B, Crimmins N, Walunas T, Liu C, Crosslin D, Benoit B, Rosenthal E, Pacheco JA, Ostropelets A, Reyes Nieva H, Patterson JS, Richter LR, Callahan TJ, Elhussein A, Pang C, Kiryluk K, Nestor J, Khan A, Mohan S, Minty E, Chung W, Wei WQ, Natarajan K, Weng C. A metadata framework for computational phenotypes. *JAMIA Open.* 2023;6(2):ooad032. Epub 20230509. doi: 10.1093/jamiaopen/ooad032. PubMed PMID: 37181728; PubMed Central PMCID: PMC10168627.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

555. Yoo H, Yum Y, Park SW, Lee JM, Jang M, Kim Y, Kim JH, Park HJ, Han KS, Park JH, Joo HJ. Standardized Database of 12-Lead Electrocardiograms with a Common Standard for the Promotion of Cardiovascular Research: KURIAS-ECG. *Healthc Inform Res.* 2023;29(2):132-44. Epub 20230430. doi: 10.4258/hir.2023.29.2.132. PubMed PMID: 37190737; PubMed Central PMCID: PMC10209728.
556. Lee GH, Park J, Kim J, Kim Y, Choi B, Park RW, Rhee SY, Shin SY. Feasibility Study of Federated Learning on the Distributed Research Network of OMOP Common Data Model. *Healthc Inform Res.* 2023;29(2):168-73. Epub 20230430. doi: 10.4258/hir.2023.29.2.168. PubMed PMID: 37190741; PubMed Central PMCID: PMC10209729.
557. Reinecke I, Henke E, Peng Y, Sedlmayr M, Bathelt F. Fitness for Use of Anatomical Therapeutic Classification for Real World Data Research. *Stud Health Technol Inform.* 2023;302:711-5. doi: 10.3233/shti230245. PubMed PMID: 37203475.
558. Peng Y, Henke E, Sedlmayr M, Bathelt F. Towards ETL Processes to OMOP CDM Using Metadata and Modularization. *Stud Health Technol Inform.* 2023;302:751-2. doi: 10.3233/shti230256. PubMed PMID: 37203486.
559. Haug M, Kolde R, Oja M, Pajusalu M. Modeling Patient Treatment Trajectories Using Markov Chains for Cost Analysis. *Stud Health Technol Inform.* 2023;302:755-6. doi: 10.3233/shti230258. PubMed PMID: 37203488.
560. Katsch F, Hussein R, Korntheuer R, Duftschmid G. Converting HL7 CDA Based Nationwide Austrian Medication Data to OMOP CDM. *Stud Health Technol Inform.* 2023;302:899-900. doi: 10.3233/shti230300. PubMed PMID: 37203528.
561. Markus AF, Fridgeirsson EA, Kors JA, Verhamme KMC, Rijnbeek PR. Challenges of Estimating Global Feature Importance in Real-World Health Care Data. *Stud Health Technol Inform.* 2023;302:1057-61. doi: 10.3233/shti230346. PubMed PMID: 37203580.
562. Henke E, Zoch M, Reinecke I, Spoden M, Ruhnke T, Günster C, Sedlmayr M, Bathelt F. German Claims Data for Real-World Research: Content Coverage Evaluation in OMOP CDM. *Stud Health Technol Inform.* 2023;302:3-7. doi: 10.3233/shti230053. PubMed PMID: 37203598.
563. Yang C, Fridgeirsson EA, Kors JA, Reys JM, Rijnbeek PR, Wong J, Williams RD. Does Using a Stacking Ensemble Method to Combine Multiple Base Learners Within a Database Improve Model Transportability? *Stud Health Technol Inform.* 2023;302:129-30. doi: 10.3233/shti230080. PubMed PMID: 37203625.
564. Williams RD, den Otter S, Reys JM, Rijnbeek PR. The DELPHI Library: Improving Model Validation, Transparency and Dissemination Through a Centralised Library of Prediction Models. *Stud Health Technol Inform.* 2023;302:139-40. doi: 10.3233/shti230085. PubMed PMID: 37203630.
565. Oh SW, Ko SJ, Im YS, Jung S, Choi BY, Kim JY, Choi W, Choi IY. Data Quality Assessment for Observational Medical Outcomes Partnership Common Data Model of Multi-Center. *Stud Health Technol Inform.* 2023;302:322-6. doi: 10.3233/shti230127. PubMed PMID: 37203671.
566. Blasini R, Michel-Backofen A, Schneider H, Marquardt K. RD-MON - Building a Rare Disease Monitor to Enhance Awareness for Patients with Rare Diseases in Intensive Care. *Stud Health Technol Inform.* 2023;302:358-9. doi: 10.3233/shti230139. PubMed PMID: 37203683.
567. Callahan TJ, Stefanski AL, Wyrwa JM, Zeng C, Ostropelets A, Banda JM, Baumgartner WA, Jr., Boyce RD, Casiraghi E, Coleman BD, Collins JH, Deakynne Davies SJ, Feinstein JA, Lin AY, Martin B, Matentzoglou NA, Meeker D, Reese J, Sinclair J, Taneja SB, Trinkley KE, Vasilevsky NA, Williams AE, Zhang XA, Denny JC, Ryan PB, Hripcsak G, Bennett TD, Haendel MA, Robinson PN, Hunter LE, Kahn MG. Ontologizing health systems data at scale: making translational discovery a reality. *NPJ Digit Med.* 2023;6(1):89. Epub 20230519. doi: 10.1038/s41746-023-00830-x. PubMed PMID: 37208468; PubMed Central PMCID: PMC10196319.
568. Kingsbury P, Abajian H, Abajian M, Angyan P, Espinoza J, MacDonald B, Meeker D, Wilson JP, Bahroos N. SENDAE: A resource for expanding research into social and environmental determinants of health. *Comput Methods Programs Biomed.* 2023;238:107542. Epub 20230408. doi: 10.1016/j.cmpb.2023.107542. PubMed PMID: 37224727.
569. Puttmann D, de Groot R, de Keizer N, Cornet R, Elbers PWG, Dongelmans D, Bakhshi-Raiez F. Assessing the FAIRness of databases on the EHDEN portal: A case study on two Dutch ICU databases. *Int J Med Inform.* 2023;176:105104. Epub 20230527. doi: 10.1016/j.ijmedinf.2023.105104. PubMed PMID: 37267810.
570. Williams N. Building the observational medical outcomes partnership's T-MSIS Analytic File common data model. *Inform Med Unlocked.* 2023;39. Epub 20230505. doi: 10.1016/j.imu.2023.101259. PubMed PMID: 37305615; PubMed Central PMCID: PMC10249773.
571. Bui MH, Lee DY, Park SJ, Park KH. Real-World Treatment Intensity and Patterns in Patients With Myopic Choroidal Neovascularization: Common Data Model in Ophthalmology. *J Korean Med Sci.* 2023;38(23):e174. Epub 20230612. doi: 10.3346/jkms.2023.38.e174. PubMed PMID: 37309694; PubMed Central PMCID: PMC10261705.
572. Lim JE, Kim HM, Kim JH, Baek HS, Han MY. Association between dyslipidemia and asthma in children: a systematic review and multicenter cohort study using a common data model. *Clin Exp Pediatr.* 2023;66(8):357-65. Epub 20230614. doi: 10.3345/cep.2023.00290. PubMed PMID: 37321588; PubMed Central PMCID: PMC10397992.
573. Arshad F, Schuemie MJ, Bu F, Minty EP, Alshammari TM, Lai LYH, Duarte-Salles T, Fortin S, Nyberg F, Ryan PB, Hripcsak G, Prieto-Alhambra D, Suchard MA. Serially Combining Epidemiological Designs Does Not Improve Overall Signal Detection in Vaccine Safety Surveillance. *Drug Saf.* 2023;46(8):797-807. Epub 20230616. doi: 10.1007/s40264-023-01324-1. PubMed PMID: 37328600; PubMed Central PMCID: PMC10345011.
574. Fouladvand S, Noshad M, Goldstein MK, Periyakoi VJ, Chen JH. Mild Cognitive Impairment: Data-Driven Prediction, Risk Factors, and Workup. *AMIA Jt Summits Transl Sci Proc.* 2023;2023:167-75. Epub 20230616. PubMed PMID: 37350911; PubMed Central PMCID: PMC10283085.
575. Kiwuwa-Muyingo S, Todd J, Bhattacharjee T, Taylor A, Greenfield J. Enabling data sharing and utilization for African population health data using OHDSI tools with an OMOP-common data model. *Front Public Health.* 2023;11:1116682. Epub 20230609. doi: 10.3389/fpubh.2023.1116682. PubMed PMID: 37361151; PubMed Central PMCID: PMC10287979.
576. Itzel T, Falconer T, Roig A, Daza J, Park J, Cheong JY, Park RW, Wiest I, Ebert MP, Hripcsak G, Teufel A. Efficacy of Co-Medications in Patients with Alcoholic Liver Disease. *Dig Dis.* 2023;41(5):780-8. Epub 20230626. doi: 10.1159/000529914. PubMed PMID: 37364547.
577. Ko S, Chang SH, Chung YW, Seo YG, Kang DY, Kim K, Chang DJ, Choi IY. Investigation of hepatic adverse events due to quetiapine by using the common data model. *Pharmacoepidemiol Drug Saf.* 2023;32(12):1341-9. Epub 20230712. doi: 10.1002/pds.5663. PubMed PMID: 37366649.
578. Dimitriadis V, Chytas A, Grammatikopoulou M, Nikolaidis G, Pliatsika J, Zachariadou M, Nikolopoulos S, Natsiavas P. Use of Real-World Data to Support Adverse Drug Reactions Prevention During ePrescription. *Stud Health Technol Inform.* 2023;305:226-9. doi: 10.3233/shti230469. PubMed PMID: 37387003.
579. Krastev E, Abanos S, Kovachev P, Tcharkatchiev D. Diabetes Prevalence and Duration Data Extracted from Outpatient Records Representative for the Bulgarian Population. *Stud Health Technol Inform.* 2023;305:230-3. doi: 10.3233/shti230470. PubMed PMID: 37387004.
580. Hechtel N, Apfel-Starke J, Köhler S, Fradziak M, Schönfeld N, Steinmeyer J, Oeltze-Jafra S. Harmonisation of German Health Care Data Using the OMOP Common Data Model - A Practice Report. *Stud Health Technol Inform.* 2023;305:287-90. doi: 10.3233/shti230485. PubMed PMID: 37387019.
581. Hardin J, Makadia R, Black S, Lara-Corrales I, Diaz LZ, Kirby JS, DeKlotz CMC. Characteristics and treatment pathways in pediatric and adult hidradenitis suppurativa: An examination using real world data. *JAAD Int.* 2023;12:124-32. Epub 20230530. doi: 10.1016/j.jdin.2023.05.011. PubMed PMID: 37409312; PubMed Central PMCID: PMC10319301.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
381	14	16	24	29	38	46	79	112	124	108	167

582. Mayer CS, Huser V. Learning important common data elements from shared study data: The All of Us program analysis. *PLoS One*. 2023;18(7):e0283601. Epub 20230707. doi: 10.1371/journal.pone.0283601. PubMed PMID: 37418391; PubMed Central PMCID: PMC10328251.
583. Kohler S, Boscá D, Kärcher F, Haarbrandt B, Prinz M, Marschollek M, Eils R. Eos and OMOCL: Towards a seamless integration of openEHR records into the OMOP Common Data Model. *J Biomed Inform*. 2023;144:104437. Epub 20230712. doi: 10.1016/j.jbi.2023.104437. PubMed PMID: 37442314.
584. Im YG, Han MY, Baek HS. Association of Serum Vitamin D Level with Temporomandibular Disorder Incidence: A Retrospective, Multi-Center Cohort Study Using Six Hospital Databases. *Nutrients*. 2023;15(13). Epub 20230624. doi: 10.3390/nu15132860. PubMed PMID: 37447187; PubMed Central PMCID: PMC10343618.
585. Tavakoli K, Kalaw FGP, Bhanvadia S, Hogarth M, Baxter SL. Concept Coverage Analysis of Ophthalmic Infections and Trauma among the Standardized Medical Terminologies SNOMED-CT, ICD-10-CM, and ICD-11. *Ophthalmol Sci*. 2023;3(4):100337. Epub 20230525. doi: 10.1016/j.xops.2023.100337. PubMed PMID: 37449050; PubMed Central PMCID: PMC10336190.
586. Oniani D, Parmanto B, Saptano A, Bove A, Freburger J, Visweswaran S, Cappella N, McLay B, Silverstein JC, Becich MJ, Delitto A, Skidmore E, Wang Y. ReDWINE: A clinical datamart with text analytical capabilities to facilitate rehabilitation research. *Int J Med Inform*. 2023;177:105144. Epub 20230711. doi: 10.1016/j.ijmedinf.2023.105144. PubMed PMID: 37459703; PubMed Central PMCID: PMC10528160.
587. Lee YJ, Kim J, Han Y, Hwang K, Choi B, Oh TR, Kim IY, Rhee H. Risk of Hyponatremia after Tramadol/Acetaminophen Single-Pill Combination Therapy: A Real-World Study Based on the OMOP-CDM Database. *Drugs R D*. 2023;23(3):289-96. Epub 20230728. doi: 10.1007/s40268-023-00436-4. PubMed PMID: 37507616; PubMed Central PMCID: PMC10439094.
588. Ahmadi N, Zoch M, Kelbert P, Noll R, Schaaf J, Wolfien M, Sedlmayr M. Methods Used in the Development of Common Data Models for Health Data: Scoping Review. *JMIR Med Inform*. 2023;11:e45116. Epub 20230803. doi: 10.2196/45116. PubMed PMID: 37535410; PubMed Central PMCID: PMC10436118.
589. Seinen TM, Kors JA, van Mulligen EM, Fridgeirsson E, Rijnbeek PR. The added value of text from Dutch general practitioner notes in predictive modeling. *J Am Med Inform Assoc*. 2023;30(12):1973-84. doi: 10.1093/jamia/ocad160. PubMed PMID: 37587084; PubMed Central PMCID: PMC10654855.
590. Birch RJ, Umbel K, Karafin MS, Goel R, Mathew S, Pace W. How do we build a comprehensive Vein-to-Vein (V2V) database for conduct of observational studies in transfusion medicine? Demonstrated with the Recipient Epidemiology and Donor Evaluation Study-IV-Pediatric V2V database protocol. *Transfusion*. 2023;63(9):1623-32. Epub 20230819. doi: 10.1111/trf.17507. PubMed PMID: 37596918.
591. Wu Q, Schuemie MJ, Suchard MA, Ryan P, Hripscak GM, Rohde CA, Chen Y. Padé approximant meets federated learning: A nearly lossless, one-shot algorithm for evidence synthesis in distributed research networks with rare outcomes. *J Biomed Inform*. 2023;145:104476. Epub 20230819. doi: 10.1016/j.jbi.2023.104476. PubMed PMID: 37598737; PubMed Central PMCID: PMC11056245.
592. Adelman MJ, Sivesind TE, Weber I, Bosma G, Hochheimer C, Karimkhani C, Schilling LM, Barbieri JS, Dellavalle RP. Prescribing Patterns of Oral Antibiotics and Isotretinoin for Acne in a Colorado Hospital System: Retrospective Cohort Study. *JMIR Dermatol*. 2023;6:e42883. Epub 20230821. doi: 10.2196/42883. PubMed PMID: 37603402; PubMed Central PMCID: PMC10477922.
593. Li M, Itzel T, Montagut NE, Falconer T, Daza J, Park J, Cheong JY, Park RW, Wiest I, Ebert MP, Hripscak G, Teufel A. Impact of concomitant cardiovascular medications on overall survival in patients with liver cirrhosis. *Scand J Gastroenterol*. 2023;58(12):1505-13. Epub 20230822. doi: 10.1080/00365521.2023.2239974. PubMed PMID: 37608699.
594. Henke E, Peng Y, Reinecke I, Zoch M, Sedlmayr M, Bathelt F. An Extract-Transform-Load Process Design for the Incremental Loading of German Real-World Data Based on FHIR and OMOP CDM: Algorithm Development and Validation. *JMIR Med Inform*. 2023;11:e47310. Epub 20230821. doi: 10.2196/47310. PubMed PMID: 37621207; PubMed Central PMCID: PMC10466444.
595. Carus J, Trübe L, Szczepanski P, Nürnberg S, Hees H, Bartels S, Nennecke A, Ückert F, Gundler C. Mapping the Oncological Basis Dataset to the Standardized Vocabularies of a Common Data Model: A Feasibility Study. *Cancers (Basel)*. 2023;15(16). Epub 20230811. doi: 10.3390/cancers15164059. PubMed PMID: 37627087; PubMed Central PMCID: PMC10452256.
596. Przysucha M, Hüsers J, Liberman D, Kersten O, Schlüter A, Fraas S, Busch D, Moelleken M, Erfurt-Berge C, Dissemmond J, Hübner U. Design and Implementation of an ETL-Process to Transfer Wound-Related Data into a Standardized Common Data Model. *Stud Health Technol Inform*. 2023;307:258-66. doi: 10.3233/shti230723. PubMed PMID: 37697861.
597. de Groot R, Püttmann DP, Fleuren LM, Thorat PJ, Elbers PWG, de Keizer NF, Cornet R. Determining and assessing characteristics of data element names impacting the performance of annotation using Usagi. *Int J Med Inform*. 2023;178:105200. Epub 20230829. doi: 10.1016/j.ijmedinf.2023.105200. PubMed PMID: 37703800.
598. Raventós B, Fernández-Bertolín S, Aragón M, Voss EA, Blacketer C, Méndez-Boo L, Recalde M, Roel E, Pistillo A, Reyes C, van Sandijk S, Halvorsen L, Rijnbeek PR, Burn E, Duarte-Salles T. Transforming the Information System for Research in Primary Care (SIDIAP) in Catalonia to the OMOP Common Data Model and Its Use for COVID-19 Research. *Clin Epidemiol*. 2023;15:969-86. Epub 20230913. doi: 10.2147/clep.S419481. PubMed PMID: 37724311; PubMed Central PMCID: PMC10505380.
599. You SC, Seo SI, Falconer T, Yanover C, Duarte-Salles T, Seager S, Posada JD, Shah NH, Nguyen PA, Kim Y, Hsu JC, Van Zandt M, Hsu MH, Lee HL, Ko H, Shin WG, Pratt N, Park RW, Reich CG, Suchard MA, Hripscak G, Park CH, Prieto-Alhambra D. Ranitidine Use and Incident Cancer in a Multinational Cohort. *JAMA Netw Open*. 2023;6(9):e2333495. Epub 20230905. doi: 10.1001/jamanetworkopen.2023.33495. PubMed PMID: 37725377; PubMed Central PMCID: PMC10509724.
600. Urdiales T, Dernie F, Català M, Prats-Urbe A, Prats C, Prieto-Alhambra D. Association between ethnic background and COVID-19 morbidity, mortality and vaccination in England: a multistate cohort analysis using the UK Biobank. *BMJ Open*. 2023;13(9):e074367. Epub 20230921. doi: 10.1136/bmjopen-2023-074367. PubMed PMID: 37734898; PubMed Central PMCID: PMC10514643.
601. Oliver M, Allyn J, Carencotte R, Allou N, Ferdynus C. Introducing the BlendedICU dataset, the first harmonized, international intensive care dataset. *J Biomed Inform*. 2023;146:104502. Epub 20230927. doi: 10.1016/j.jbi.2023.104502. PubMed PMID: 37769828.
602. Frid S, Bracons Cucó G, Gil Rojas J, López-Rueda A, Pastor Duran X, Martínez-Sáez O, Lozano-Rubí R. Evaluation of OMOP CDM, i2b2 and ICGC ARGO for supporting data harmonization in a breast cancer use case of a multicentric European AI project. *J Biomed Inform*. 2023;147:104505. Epub 20230927. doi: 10.1016/j.jbi.2023.104505. PubMed PMID: 37774908.
603. Kim JW, Kim C, Kim KH, Lee Y, Yu DH, Yun J, Baek H, Park RW, You SC. Scalable Infrastructure Supporting Reproducible Nationwide Healthcare Data Analysis toward FAIR Stewardship. *Sci Data*. 2023;10(1):674. Epub 20231004. doi: 10.1038/s41597-023-02580-7. PubMed PMID: 37794003; PubMed Central PMCID: PMC10550904.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

604. Gauffin O, Brand JS, Vidlin SH, Sartori D, Asikainen S, Català M, Chalabi E, Dedman D, Danilovic A, Duarte-Salles T, Garcia Morales MT, Hiltunen S, Jödicke AM, Lazarevic M, Mayer MA, Miladinovic J, Mitchell J, Pistillo A, Ramirez-Anguila JM, Reyes C, Rudolph A, Sandberg L, Savage R, Schuemie M, Spasic D, Trinh NTH, Veljkovic N, Vujovic A, de Wilde M, Zekarias A, Rijnbeek P, Ryan P, Prieto-Alhambra D, Norén GN. Supporting Pharmacovigilance Signal Validation and Prioritization with Analyses of Routinely Collected Health Data: Lessons Learned from an EH DEN Network Study. *Drug Saf.* 2023;46(12):1335-52. Epub 20231007. doi: 10.1007/s40264-023-01353-w. PubMed PMID: 37804398; PubMed Central PMCID: PMC10684396.
605. Oh S, Joo HJ, Sohn JW, Park S, Jang JS, Seong J, Park KJ, Lee SH. Cloud-based digital healthcare development for precision medical hospital information system. *Per Med.* 2023;20(5):435-44. Epub 20231009. doi: 10.2217/pme-2023-0074. PubMed PMID: 37811595.
606. Khera R, Dhingra LS, Aminorroaya A, Li K, Zhou JJ, Arshad F, Blacketer C, Bowring MG, Bu F, Cook M, Dorr DA, Duarte-Salles T, DuVall SL, Falconer T, French TE, Hanchrow EE, Horban S, Lau WC, Li J, Liu Y, Lu Y, Man KK, Matheny ME, Mathioudakis N, McLemore MF, Minty E, Morales DR, Nagy P, Nishimura A, Ostroplets A, Pistillo A, Posada JD, Pratt N, Reyes C, Ross JS, Seager S, Shah N, Simon K, Wan EY, Yang J, Yin C, You SC, Schuemie MJ, Ryan PB, Hripcsak G, Krumholz H, Suchard MA. Multinational patterns of second line antihyperglycaemic drug initiation across cardiovascular risk groups: federated pharmacoepidemiological evaluation in LEGEND-T2DM. *BMJ Med.* 2023;2(1):e000651. Epub 20231006. doi: 10.1136/bmjmed-2023-000651. PubMed PMID: 37829182; PubMed Central PMCID: PMC10565313.
607. Mészáros Á, Kovács S, Héja T, Bagyura Z, Zemplényi A. Mapping Hungarian procedure codes to SNOMED CT. *BMC Med Res Methodol.* 2023;23(1):240. Epub 20231018. doi: 10.1186/s12874-023-02036-x. PubMed PMID: 37853326; PubMed Central PMCID: PMC10585817.
608. Sadsad R, Ruber G, Zhou J, Nicklin S, Tsafnat G. A computable biomedical knowledge object for calculating in-hospital mortality for patients admitted with acute myocardial infarction. *Learn Health Syst.* 2023;7(4):e10388. Epub 20230911. doi: 10.1002/lrh2.10388. PubMed PMID: 37860059; PubMed Central PMCID: PMC10582239.
609. Krastev E, Tcharaktchiev D, Abanos S. Application of OMOP Common Data Model for Data Integration: The Bulgarian Diabetes Register. *Stud Health Technol Inform.* 2023;309:141-2. doi: 10.3233/shi230761. PubMed PMID: 37869827.
610. Henke E, Zoch M, Kallfelz M, Ruhnke T, Leutner LA, Spoden M, Günster C, Sedlmayr M, Bathelt F. Assessing the Use of German Claims Data Vocabularies for Research in the Observational Medical Outcomes Partnership Common Data Model: Development and Evaluation Study. *JMIR Med Inform.* 2023;11:e47959. Epub 20231107. doi: 10.2196/47959. PubMed PMID: 37942786; PubMed Central PMCID: PMC10653283.
611. Voss EA, Blacketer C, van Sandijk S, Moinat M, Kallfelz M, van Speybroeck M, Prieto-Alhambra D, Schuemie MJ, Rijnbeek PR. European Health Data & Evidence Network-learnings from building out a standardized international health data network. *J Am Med Inform Assoc.* 2023;31(1):209-19. doi: 10.1093/jamia/ocad214. PubMed PMID: 37952118; PubMed Central PMCID: PMC10746315.
612. Choi JY, Yoo S, Song W, Kim S, Baek H, Lee JS, Yoon YS, Yoon S, Lee HY, Kim KI. Development and Validation of a Prognostic Classification Model Predicting Postoperative Adverse Outcomes in Older Surgical Patients Using a Machine Learning Algorithm: Retrospective Observational Network Study. *J Med Internet Res.* 2023;25:e42259. Epub 20231113. doi: 10.2196/42259. PubMed PMID: 37955965; PubMed Central PMCID: PMC10682929.
613. Seol S, Choi JR, Choi B, Kim S, Jeon JY, Park KN, Park JH, Park MW, Eun YG, Park JJ, Lee BJ, Shin YS, Kim CH, Park RW, Jang JY. Effect of statin use on head and neck cancer prognosis in a multicenter study using a Common Data Model. *Sci Rep.* 2023;13(1):19770. Epub 20231113. doi: 10.1038/s41598-023-45654-7. PubMed PMID: 37957229; PubMed Central PMCID: PMC10643676.
614. Cai CX, Halfpenny W, Boland MV, Lehmann HP, Hribar M, Goetz KE, Baxter SL. Advancing Toward a Common Data Model in Ophthalmology: Gap Analysis of General Eye Examination Concepts to Standard Observational Medical Outcomes Partnership (OMOP) Concepts. *Ophthalmol Sci.* 2023;3(4):100391. Epub 20230825. doi: 10.1016/j.xops.2023.100391. PubMed PMID: 38025162; PubMed Central PMCID: PMC10630664.
615. Guo LL, Calligan M, Vettese E, Cook S, Gagnidze G, Han O, Inoue J, Lemmon J, Li J, Roshdi M, Sadovy B, Wallace S, Sung L. Development and validation of the SickKids Enterprise-wide Data in Azure Repository (SEDAR). *Heliyon.* 2023;9(11):e21586. Epub 20231102. doi: 10.1016/j.heliyon.2023.e21586. PubMed PMID: 38027579; PubMed Central PMCID: PMC10661187.
616. Makadia R, Shoabi A, Rao GA, Ostroplets A, Rijnbeek PR, Voss EA, Duarte-Salles T, Ramirez-Anguila JM, Mayer MA, Maljković F, Denaxas S, Nyberg F, Papez V, Sena AG, Alshammari TM, Lai LYH, Haynes K, Suchard MA, Hripcsak G, Ryan PB. Evaluating the impact of alternative phenotype definitions on incidence rates across a global data network. *JAMIA Open.* 2023;6(4):o0ad096. Epub 20231121. doi: 10.1093/jamiaopen/o0ad096. PubMed PMID: 38028730; PubMed Central PMCID: PMC10662662.
617. Mayer CS. Conversion of CPRD AURUM Data into the OMOP Common Data Model. *Inform Med Unlocked.* 2023;43. Epub 20231110. doi: 10.1016/j.imu.2023.101407. PubMed PMID: 38046363; PubMed Central PMCID: PMC10688258.
618. Oja M, Tamm S, Mooses K, Pajusalu M, Talvik HA, Ott A, Laht M, Malk M, Lõo M, Holm J, Haug M, Šuvalov H, Särg D, Vilo J, Laur S, Kolde R, Reisberg S. Transforming Estonian health data to the Observational Medical Outcomes Partnership (OMOP) Common Data Model: lessons learned. *JAMIA Open.* 2023;6(4):o0ad100. Epub 20231205. doi: 10.1093/jamiaopen/o0ad100. PubMed PMID: 38058679; PubMed Central PMCID: PMC10697784.
619. Kalokyri V, Kondylakis H, Sfakianakis S, Nikiforaki K, Karatzanis I, Mazzetti S, Tachos N, Regge D, Fotiadis DI, Marias K, Tsiknakis M. MI-Common Data Model: Extending Observational Medical Outcomes Partnership-Common Data Model (OMOP-CDM) for Registering Medical Imaging Metadata and Subsequent Curation Processes. *JCO Clin Oncol Inform.* 2023;7:e2300101. doi: 10.1200/cci.23.00101. PubMed PMID: 38061012; PubMed Central PMCID: PMC10715775.
620. Fridgeirsson EA, Sontag D, Rijnbeek P. Attention-based neural networks for clinical prediction modelling on electronic health records. *BMC Med Res Methodol.* 2023;23(1):285. Epub 20231207. doi: 10.1186/s12874-023-02112-2. PubMed PMID: 38062352; PubMed Central PMCID: PMC10701944.
621. Choi K, Park SJ, Han S, Mun Y, Lee DY, Chang DJ, Kim S, Yoo S, Woo SJ, Park KH, Suh HS. Patient-Centered Economic Burden of Exudative Age-Related Macular Degeneration: Retrospective Cohort Study. *JMIR Public Health Surveill.* 2023;9:e49852. Epub 20231208. doi: 10.2196/49852. PubMed PMID: 38064251; PubMed Central PMCID: PMC10746973.
622. Blasini R, Buchowicz KM, Schneider H, Samans B, Sohrabi K. Implementation of inclusion and exclusion criteria in clinical studies in OHDSI ATLAS software. *Sci Rep.* 2023;13(1):22457. Epub 20231218. doi: 10.1038/s41598-023-49560-w. PubMed PMID: 38105303; PubMed Central PMCID: PMC10725886.
623. Heudel P, Crochet H, Durand T, Zrounba P, Blay JY. From data strategy to implementation to advance cancer research and cancer care: A French comprehensive cancer center experience. *PLOS Digit Health.* 2023;2(12):e0000415. Epub 20231219. doi: 10.1371/journal.pdig.0000415. PubMed PMID: 38113207; PubMed Central PMCID: PMC10729983.
624. Khan H, Mosa ASM, Paka V, Rana MKZ, Mandhadi V, Islam S, Xu H, McClay JC, Sarker S, Rao P, Waitman LR. Mapping Clinical Documents to the Logical Observation Identifiers, Names and Codes (LOINC) Document Ontology using Electronic Health Record Systems Structured Metadata. *AMIA Annu Symp Proc.* 2023;2023:1017-26. Epub 20240111. PubMed PMID: 38222329; PubMed Central PMCID: PMC10785913.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

625. Lyu T, Liang C. Computational Phenotyping of OMOP CDM Normalized EHR for Prenatal and Postpartum Episodes: An Informatics Framework and Clinical Implementation on All of Us. *AMIA Annu Symp Proc.* 2023;2023:1096-104. Epub 20240111. PubMed PMID: 38222375; PubMed Central PMCID: PMC10785883.
626. Zuo X, Zhou Y, Duke J, Hripcsak G, Shah N, Banda JM, Reeves R, Miller T, Waitman LR, Natarajan K, Xu H. Standardizing Multi-site Clinical Note Titles to LOINC Document Ontology: A Transformer-based Approach. *AMIA Annu Symp Proc.* 2023;2023:834-43. Epub 20240111. PubMed PMID: 38222429; PubMed Central PMCID: PMC10785935.
627. Swerdel JN, Conover MM. Comparing broad and narrow phenotype algorithms: differences in performance characteristics and immortal time incurred. *J Pharm Pharm Sci.* 2023;26:12095. Epub 20240103. doi: 10.3389/jpps.2023.12095. PubMed PMID: 38235322; PubMed Central PMCID: PMC10791821.
628. Claire R, Elvidge J, Hanif S, Goovaerts H, Rijnbeek PR, Jónsson P, Facey K, Dawoud D. Advancing the use of real world evidence in health technology assessment: insights from a multi-stakeholder workshop. *Front Pharmacol.* 2023;14:1289365. Epub 20240112. doi: 10.3389/fphar.2023.1289365. PubMed PMID: 38283835; PubMed Central PMCID: PMC10811058.
629. Yang C, Fridgeirsson EA, Kors JA, Reps JM, Rijnbeek PR. Impact of random oversampling and random undersampling on the performance of prediction models developed using observational health data. *Journal of Big Data.* 2024;11(1):7. doi: 10.1186/s40537-023-00857-7.
630. Pav V, Burns A, Colahan C, Robison B, Kean J, DuVall S. Illustration of Continuous Enrollment and Beneficiary Categorization in DoD and VA Infrastructure for Clinical Intelligence. *Mil Med.* 2024;189(3-4):466-74. doi: 10.1093/milmed/usac352. PubMed PMID: 36461620.
631. Choi B, Oh AR, Park J, Lee JH, Yang K, Lee DY, Rhee SY, Kang SS, Lee SD, Lee SH, Jeong CW, Park B, Seol S, Park RW, Lee S. Perioperative adverse cardiac events and mortality after non-cardiac surgery: a multicenter study. *Korean J Anesthesiol.* 2024;77(1):66-76. Epub 20230510. doi: 10.4097/kja.23043. PubMed PMID: 37169362; PubMed Central PMCID: PMC10834726.
632. Gandaglia G, Pellegrino F, Golozar A, De Meulder B, Abbott T, Achtman A, Imran Omar M, Alshammari T, Areia C, Asimwe A, Beyer K, Bjartell A, Campi R, Cornford P, Falconer T, Feng Q, Gong M, Herrera R, Hughes N, Hulsen T, Kinnaird A, Lai LYH, Maresca G, Mottet N, Oja M, Prinsen P, Reich C, Remmers S, Roobol MJ, Sakalis V, Seager S, Smith EJ, Snijder R, Steinbeisser C, Thurin NH, Hijazy A, van Bochove K, Van den Bergh RCN, Van Hemelrijck M, Willemse PP, Williams AE, Zounemat Kermani N, Evans-Axelsson S, Briganti A, N'Dow J. Clinical Characterization of Patients Diagnosed with Prostate Cancer and Undergoing Conservative Management: A PIONEER Analysis Based on Big Data. *Eur Urol.* 2024;85(5):457-65. Epub 20230705. doi: 10.1016/j.eururo.2023.06.012. PubMed PMID: 37414703.
633. Lee S, Shin H, Choe S, Kang MG, Kim SH, Kang DY, Kim JH. MetaLAB-HOI: Template standardization of health outcomes enable massive and accurate detection of adverse drug reactions from electronic health records. *Pharmacoepidemiol Drug Saf.* 2024;33(1):e5694. Epub 20230914. doi: 10.1002/pds.5694. PubMed PMID: 37710363.
634. Raventós B, Català M, Du M, Guo Y, Black A, Inberg G, Li X, López-Güell K, Newby D, de Ridder M, Barboza C, Duarte-Salles T, Verhamme K, Rijnbeek P, Prieto Alhambra D, Burn E. IncidencePrevalence: An R package to calculate population-level incidence rates and prevalence using the OMOP common data model. *Pharmacoepidemiol Drug Saf.* 2024;33(1):e5717. Epub 20231025. doi: 10.1002/pds.5717. PubMed PMID: 37876360.
635. Grammes J, Schmid S, Bozkurt L, Heinemann L, Hess G, Kubiak T, Küstner E, Priesterroth LS, Stahl C, Holl RW. Continuous glucose monitoring in older adults with diabetes: Data from the diabetes prospective follow-up (DPV) registry. *Diabet Med.* 2024;41(3):e15261. Epub 20231127. doi: 10.1111/dme.15261. PubMed PMID: 38009855.
636. Bu F, Schuemie MJ, Nishimura A, Smith LH, Kostka K, Falconer T, McLeggon JA, Ryan PB, Hripcsak G, Suchard MA. Bayesian safety surveillance with adaptive bias correction. *Stat Med.* 2024;43(2):395-418. Epub 20231127. doi: 10.1002/sim.9968. PubMed PMID: 38010062.
637. Rueda M, Leist IC, Gut IG. Convert-Pheno: A software toolkit for the interconversion of standard data models for phenotypic data. *J Biomed Inform.* 2024;149:104558. Epub 20231129. doi: 10.1016/j.jbi.2023.104558. PubMed PMID: 38035971.
638. Pera V, van Vaerenbergh F, Kors JA, van Mulligen EM, Parry R, de Wilde M, Lahousse L, van der Lei J, Rijnbeek PR, Verhamme KMC. Descriptive analysis on disproportionate medication errors and associated patient characteristics in the Food and Drug Administration's Adverse Event Reporting System. *Pharmacoepidemiol Drug Saf.* 2024;33(1):e5743. Epub 20231229. doi: 10.1002/pds.5743. PubMed PMID: 38158381.
639. Baxter R, Nind T, Sutherland J, McAllister G, Hardy D, Hume A, MacLeod R, Caldwell J, Krueger S, Tramma L, Teviotdale R, Gillen K, Scobbie D, Baillie I, Brooks A, Prodan B, Kerr W, Sloan-Murphy D, Herrera JFR, van Beek EJR, Reel PS, Reel S, Mansouri-Benssassi E, Mudie R, Steele D, Doney A, Trucco E, Morris C, Wallace R, Morris A, Parsons M, Jefferson E. The Scottish Medical Imaging Archive: 57.3 Million Radiology Studies Linked to Their Medical Records. *Radiol Artif Intell.* 2024;6(1):e220266. doi: 10.1148/ryai.220266. PubMed PMID: 38166330; PubMed Central PMCID: PMC10831519.
640. Reich C, Ostropolets A, Ryan P, Rijnbeek P, Schuemie M, Davydov A, Dymshyts D, Hripcsak G. OHDSI Standardized Vocabularies-a large-scale centralized reference ontology for international data harmonization. *J Am Med Inform Assoc.* 2024;31(3):583-90. doi: 10.1093/jamia/ocad247. PubMed PMID: 38175665; PubMed Central PMCID: PMC10873827.
641. Català M, Mercadé-Besora N, Kolde R, Trinh NTH, Roel E, Burn E, Rathod-Mistry T, Kostka K, Man WY, Delmestri A, Nordeng HME, Uusküla A, Duarte-Salles T, Prieto-Alhambra D, Jödicke AM. The effectiveness of COVID-19 vaccines to prevent long COVID symptoms: staggered cohort study of data from the UK, Spain, and Estonia. *Lancet Respir Med.* 2024;12(3):225-36. Epub 20240111. doi: 10.1016/s2213-2600(23)00414-9. PubMed PMID: 38219763.
642. Gan S, Kim C, Lee DY, Park RW. Prediction Models for Readmission Using Home Healthcare Notes and OMOP-CDM. *Stud Health Technol Inform.* 2024;310:1438-9. doi: 10.3233/shti231233. PubMed PMID: 38269685.
643. Park C, Park SJ, Lee DY, You SC, Lee K, Park RW. Multi-Institutional Collaborative Research Using Ophthalmic Medical Image Data Standardized by Radiology Common Data Model (R-CDM). *Stud Health Technol Inform.* 2024;310:48-52. doi: 10.3233/shti230925. PubMed PMID: 38269763.
644. Ranallo P, Southwell B, Tignanelli C, Johnson SG, Krueger R, Sevareid-Groth T, Carvel A, Melton GB. Promoting Learning Health System Cycles by Optimizing EHR Data Clinical Concept Encoding Processes. *Stud Health Technol Inform.* 2024;310:68-73. doi: 10.3233/shti230929. PubMed PMID: 38269767.
645. DuVall SL, Parker CG, Shields AR, Alba PR, Lynch JA, Matheny ME, Kamaau AWC. Toward Real-World Reproducibility: Verifying Value Sets for Clinical Research. *Stud Health Technol Inform.* 2024;310:164-8. doi: 10.3233/shti230948. PubMed PMID: 38269786.
646. Oh SW, Ko SJ, Im YS, Jung S, Choi BY, Kim JY, Park S, Choi W, Choi IY. Development of Integrated Data Quality Management System for Observational Medical Outcomes Partnership Common Data Model. *Stud Health Technol Inform.* 2024;310:349-53. doi: 10.3233/shti230985. PubMed PMID: 38269823.
647. Schuemie M, Reps J, Black A, Defalco F, Evans L, Fridgeirsson E, Gilbert JP, Knoll C, Lavallee M, Rao GA, Rijnbeek P, Sadowski K, Sena A, Swerdel J, Williams RD, Suchard M. Health-Analytics Data to Evidence Suite (HADES): Open-Source Software for Observational Research. *Stud Health Technol Inform.* 2024;310:966-70. doi: 10.3233/shti231108. PubMed PMID: 38269952; PubMed Central PMCID: PMC10868467.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

648. Cha J, Ahn EK, Yoon YH, Park MY. Feasibility of Applying the OMOP Common Data Model to Traditional Eastern Asian Medicine Dataset. *Stud Health Technol Inform.* 2024;310:1349-51. doi: 10.3233/shti231189. PubMed PMID: 38270038.
649. Ahmadi N, Nguyen QV, Sedlmayr M, Wolfien M. A comparative patient-level prediction study in OMOP CDM: applicative potential and insights from synthetic data. *Sci Rep.* 2024;14(1):2287. Epub 20240127. doi: 10.1038/s41598-024-52723-y. PubMed PMID: 38280887; PubMed Central PMCID: PMC10821926.
650. Park WY, Jeon K, Schmidt TS, Kondylakis H, Alkasab T, Dewey BE, You SC, Nagy P. Development of Medical Imaging Data Standardization for Imaging-Based Observational Research: OMOP Common Data Model Extension. *J Imaging Inform Med.* 2024;37(2):899-908. Epub 20240205. doi: 10.1007/s10278-024-00982-6. PubMed PMID: 38315345; PubMed Central PMCID: PMC11031512.
651. Zhang X, Feng Y, Li F, Ding J, Tahseen D, Hinojosa E, Chen Y, Tao C. Evaluating MedDRA-to-ICD terminology mappings. *BMC Med Inform Decis Mak.* 2024;23(Suppl 4):299. Epub 20240207. doi: 10.1186/s12911-023-02375-1. PubMed PMID: 38326827; PubMed Central PMCID: PMC10851449.
652. Bhattacharjee T, Kiwuwa-Muyingo S, Kanjala C, Maoyi ML, Amadi D, Ochola M, Kadengye D, Gregory A, Kiragga A, Taylor A, Greenfield J, Slaymaker E, Todd J. INSPIRE datahub: a pan-African integrated suite of services for harmonising longitudinal population health data using OHDSI tools. *Front Digit Health.* 2024;6:1329630. Epub 20240129. doi: 10.3389/fgth.2024.1329630. PubMed PMID: 38347885; PubMed Central PMCID: PMC10859396.
653. Zisser M, Aran D. Transformer-based time-to-event prediction for chronic kidney disease deterioration. *J Am Med Inform Assoc.* 2024;31(4):980-90. doi: 10.1093/jamia/ocae025. PubMed PMID: 38349850; PubMed Central PMCID: PMC10990547.
654. Lo Re Iii V, Cocoros NM, Hubbard RA, Dutcher SK, Newcomb CW, Connolly JG, Perez-Vilar S, Carbonari DM, Kempner ME, Hernández-Muñoz JJ, Petrone AB, Pishko AM, Rogers Driscoll ME, Brash JT, Burnett S, Cohet C, Dahl M, DeFor TA, Delmestri A, Djibo DA, Duarte-Salles T, Harrington LB, Kampman M, Kuntz JL, Kurz X, Mercadé-Besora N, Pawloski PA, Rijnbeek PR, Seager S, Steiner CA, Verhamme K, Wu F, Zhou Y, Burn E, Paterson JM, Prieto-Alhambra D. Risk of Arterial and Venous Thrombotic Events Among Patients with COVID-19: A Multi-National Collaboration of Regulatory Agencies from Canada, Europe, and United States. *Clin Epidemiol.* 2024;16:71-89. Epub 20240210. doi: 10.2147/clip.S448980. PubMed PMID: 38357585; PubMed Central PMCID: PMC10865892.
655. Boeker M, Zöller D, Blasini R, Macho P, Helfer S, Behrens M, Prokosch HU, Gulden C. Effectiveness of IT-supported patient recruitment: study protocol for an interrupted time series study at ten German university hospitals. *Trials.* 2024;25(1):125. Epub 20240216. doi: 10.1186/s13063-024-07918-z. PubMed PMID: 38365848; PubMed Central PMCID: PMC10870691.
656. Hallinan CM, Ward R, Hart GK, Sullivan C, Pratt N, Ng AP, Capurro D, Van Der Vegt A, Liaw ST, Daly O, Luxan BG, Bunker D, Boyle D. Seamless EMR data access: Integrated governance, digital health and the OMOP-CDM. *BMJ Health Care Inform.* 2024;31(1). Epub 20240221. doi: 10.1136/bmjhci-2023-100953. PubMed PMID: 38387992; PubMed Central PMCID: PMC10882353.
657. Henke E, Zoch M, Peng Y, Reinecke I, Sedlmayr M, Bathelt F. Conceptual design of a generic data harmonization process for OMOP common data model. *BMC Med Inform Decis Mak.* 2024;24(1):58. Epub 20240226. doi: 10.1186/s12911-024-02458-7. PubMed PMID: 38408983; PubMed Central PMCID: PMC10895818.
658. Naderalvojud B, Curtin CM, Yanover C, El-Hay T, Choi B, Park RW, Tabuenca JG, Reeve MP, Falconer T, Humphreys K, Asch SM, Hernandez-Boussard T. Towards global model generalizability: independent cross-site feature evaluation for patient-level risk prediction models using the OHDSI network. *J Am Med Inform Assoc.* 2024;31(5):1051-61. doi: 10.1093/jamia/ocae028. PubMed PMID: 38412331; PubMed Central PMCID: PMC11031239.
659. Markus AF, Rijnbeek PR, Kors JA, Burn E, Duarte-Salles T, Haug M, Kim C, Kolde R, Lee Y, Park HS, Park RW, Prieto-Alhambra D, Reyes C, Krishnan JA, Brusselle GG, Verhamme KM. Real-world treatment trajectories of adults with newly diagnosed asthma or COPD. *BMJ Open Respir Res.* 2024;11(1). Epub 20240227. doi: 10.1136/bmjresp-2023-002127. PubMed PMID: 38413124; PubMed Central PMCID: PMC10900306.
660. Bräuner KB, Tsouchnika A, Mashkoor M, Williams R, Rosen AW, Hartwig MFS, Bulut M, Dohrn N, Rijnbeek P, Gögenur I. Prediction of 30-day, 90-day, and 1-year mortality after colorectal cancer surgery using a data-driven approach. *Int J Colorectal Dis.* 2024;39(1):31. Epub 20240229. doi: 10.1007/s00384-024-04607-w. PubMed PMID: 38421482; PubMed Central PMCID: PMC10904562.
661. Liu S, Golozar A, Buesgens N, McLeggon JA, Black A, Nagy P. A framework for understanding an open scientific community using automated harvesting of public artifacts. *JAMIA Open.* 2024;7(1):ocae017. Epub 20240229. doi: 10.1093/jamiaopen/ocae017. PubMed PMID: 38425704; PubMed Central PMCID: PMC10903973.
662. Marcou Q, Berti-Equille L, Novelli N. Creating a computer assisted ICD coding system: Performance metric choice and use of the ICD hierarchy. *J Biomed Inform.* 2024;152:104617. Epub 20240301. doi: 10.1016/j.jbi.2024.104617. PubMed PMID: 38432534.
663. Chai Y, Man KKC, Luo H, Torre CO, Wing YK, Hayes JF, Osborn DPJ, Chang WC, Lin X, Yin C, Chan EW, Lam ICH, Fortin S, Kern DM, Lee DY, Park RW, Jang JW, Li J, Seager S, Lau WCY, Wong ICK. Incidence of mental health diagnoses during the COVID-19 pandemic: a multinational network study. *Epidemiol Psychiatr Sci.* 2024;33:e9. Epub 20240304. doi: 10.1017/s2045796024000088. PubMed PMID: 38433286; PubMed Central PMCID: PMC10940053.
664. Haug M, Oja M, Pajusalu M, Mooses K, Reisberg S, Vilo J, Giménez AF, Falconer T, Danilović A, Maljkovic F, Dawoud D, Kolde R. Markov modeling for cost-effectiveness using federated health data network. *J Am Med Inform Assoc.* 2024;31(5):1093-101. doi: 10.1093/jamia/ocae044. PubMed PMID: 38472144; PubMed Central PMCID: PMC11031209.
665. Anand TV, Bu F, Schuemie MJ, Suchard MA, Hripcsak G. Comparative safety and effectiveness of angiotensin converting enzyme inhibitors and thiazides and thiazide-like diuretics under strict monotherapy. *J Clin Hypertens (Greenwich).* 2024;26(4):425-30. Epub 20240319. doi: 10.1111/jch.14793. PubMed PMID: 38501749; PubMed Central PMCID: PMC11007801.
666. Mortier P, Amigo F, Bhargav M, Conde S, Ferrer M, Flygare O, Kizilaslan B, Latorre Moreno L, Leis A, Mayer MA, Pérez-Sola V, Portillo-Van Diest A, Ramírez-Anguita JM, Sanz F, Vilagut G, Alonso J, Mehlum L, Arensman E, Bjureberg J, Pastor M, Qin P. Developing a clinical decision support system software prototype that assists in the management of patients with self-harm in the emergency department: protocol of the PERMANENS project. *BMC Psychiatry.* 2024;24(1):220. Epub 20240320. doi: 10.1186/s12888-024-05659-6. PubMed PMID: 38509500; PubMed Central PMCID: PMC10956300.
667. Cai CX, Nishimura A, Bowring MG, Westlund E, Tran D, Ng JH, Nagy P, Cook M, McLeggon JA, DuVall SL, Matheny ME, Golozar A, Ostropolets A, Minty E, Desai P, Bu F, Toy B, Hribar M, Falconer T, Zhang L, Lawrence-Archer L, Boland MV, Goetz K, Hall N, Shoaibi A, Reys J, Sena AG, Blacketer C, Swerdel J, Jhaveri KD, Lee E, Gilbert Z, Zeger SL, Crews DC, Suchard MA, Hripcsak G, Ryan PB. Similar Risk of Kidney Failure among Patients with Blinding Diseases Who Receive Ranibizumab, Aflibercept, and Bevacizumab: An Observational Health Data Sciences and Informatics Network Study. *Ophthalmol Retina.* 2024;8(8):733-43. Epub 20240320. doi: 10.1016/j.oret.2024.03.014. PubMed PMID: 38519026; PubMed Central PMCID: PMC11298306.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

668. van Baalen V, Didden EM, Rosenberg D, Bardenheuer K, van Speybroeck M, Brand M. Increase transparency and reproducibility of real-world evidence in rare diseases through disease-specific Federated Data Networks. *Pharmacoepidemiol Drug Saf.* 2024;33(4):e5778. doi: 10.1002/pds.5778. PubMed PMID: 38556812.
669. Rajwa P, Borkowetz A, Abbott T, Alberti A, Bjartell A, Brash JT, Campi R, Chilelli A, Conover M, Constantinovici N, Davies E, De Meulder B, Eid S, Gacci M, Golozar A, Hafeez H, Haque S, Hijazy A, Hulsen T, Josefsson A, Khalid S, Kolde R, Kotik D, Kurki S, Lambrecht M, Leung CH, Moreno J, Nicoletti R, Nieboer D, Oja M, Palanisamy S, Prinsen P, Reich C, Raffaele Resta G, Ribal MJ, Gómez Rivas J, Smith E, Snijder R, Steinbeisser C, Vandenberghe F, Cornford P, Evans-Axelsson S, N'Dow J, Willemse PM. Research Protocol for an Observational Health Data Analysis on the Adverse Events of Systemic Treatment in Patients with Metastatic Hormone-sensitive Prostate Cancer: Big Data Analytics Using the PIONEER Platform. *Eur Urol Open Sci.* 2024;63:81-8. Epub 20240325. doi: 10.1016/j.euros.2024.02.019. PubMed PMID: 38572301; PubMed Central PMCID: PMC10987796.
670. Almeida JR, Zúquete A, Pazos A, Oliveira JL. A federated authentication schema among multiple identity providers. *Heliyon.* 2024;10(7):e28560. Epub 20240326. doi: 10.1016/j.heliyon.2024.e28560. PubMed PMID: 38590890; PubMed Central PMCID: PMC10999912.
671. Tsafnat G, Dunscombe R, Gabriel D, Grieve G, Reich C. Converge or Collide? Making Sense of a Plethora of Open Data Standards in Health Care. *J Med Internet Res.* 2024;26:e55779. Epub 20240409. doi: 10.2196/55779. PubMed PMID: 38593431; PubMed Central PMCID: PMC11040436.
672. Lawlor A, Lin C, Gómez Rivas J, Ibáñez L, Abad López P, Willemse PP, Imran Omar M, Remmers S, Cornford P, Rajwa P, Nicoletti R, Gandaglia G, Yuen-Chun Teoh J, Moreno Sierra J, Golozar A, Bjartell A, Evans-Axelsson S, N'Dow J, Zong J, Ribal MJ, Roobol MJ, Van Hemelrijck M, Beyer K. Predictive Models for Assessing Patients' Response to Treatment in Metastatic Prostate Cancer: A Systematic Review. *Eur Urol Open Sci.* 2024;63:126-35. Epub 20240404. doi: 10.1016/j.euros.2024.03.012. PubMed PMID: 38596781; PubMed Central PMCID: PMC11001619.
673. Trinh NT, Jödicke AM, Català M, Mercadé-Besora N, Hayati S, Lupattelli A, Prieto-Alhambra D, Nordeng HM. Effectiveness of COVID-19 vaccines to prevent long COVID: data from Norway. *Lancet Respir Med.* 2024;12(5):e33-e4. Epub 20240410. doi: 10.1016/s2213-2600(24)00082-1. PubMed PMID: 38614106.
674. Gulden C, Macho P, Reinecke I, Strantz C, Prokosch HU, Blasini R. recruit: A cloud-native clinical trial recruitment support system based on Health Level 7 Fast Healthcare Interoperability Resources (HL7 FHIR) and the Observational Medical Outcomes Partnership Common Data Model (OMOP CDM). *Comput Biol Med.* 2024;174:108411. Epub 20240406. doi: 10.1016/j.combiomed.2024.108411. PubMed PMID: 38626510.
675. Ward R, Hallinan CM, Ormiston-Smith D, Chidgey C, Boyle D. The OMOP common data model in Australian primary care data: Building a quality research ready harmonised dataset. *PLoS One.* 2024;19(4):e0301557. Epub 20240418. doi: 10.1371/journal.pone.0301557. PubMed PMID: 38635655; PubMed Central PMCID: PMC11025850.
676. Kim C, Yu DH, Baek H, Cho J, You SC, Park RW. Data Resource Profile: Health Insurance Review and Assessment Service Covid-19 Observational Medical Outcomes Partnership (HIRA Covid-19 OMOP) database in South Korea. *Int J Epidemiol.* 2024;53(3). doi: 10.1093/ije/dyae062. PubMed PMID: 38658170.
677. Baumgartner M, Kreiner K, Lauschensky A, Jammerbund B, Donsa K, Hayn D, Wiesmüller F, Demelius L, Modre-Osprian R, Neururer S, Slamanig G, Prantl S, Brunelli L, Pfeifer B, Pözl G, Schreier G. Health data space nodes for privacy-preserving linkage of medical data to support collaborative secondary analyses. *Front Med (Lausanne).* 2024;11:1301660. Epub 20240410. doi: 10.3389/fmed.2024.1301660. PubMed PMID: 38660421; PubMed Central PMCID: PMC11039786.
678. Krastev E, Markov E, Abanos S, Krasteva R, Tcharaktchiev D. Mapping the Bulgarian Diabetes Register to OMOP CDM: Application Results. *Stud Health Technol Inform.* 2024;313:28-33. doi: 10.3233/shiti240007. PubMed PMID: 38682500.
679. Falgenhauer M, Lauschensky A, Kreiner K, Beyer S, Reiter K, Ziegl A, Modre-Osprian R, Pfeifer B, Neururer S, Krestan S, Wagner H, Huber A, Plaikner S, Kuppelwieser S, Widschwendter M, Schreier G. Towards an Electronic Health Prevention Record Based on HL7 FHIR and the OMOP Common Data Model. *Stud Health Technol Inform.* 2024;313:107-12. doi: 10.3233/shiti240020. PubMed PMID: 38682513.
680. Adams WG, Gasman S, Beccia AL, Fuentes L. The Health Equity Explorer: An open-source resource for distributed health equity visualization and research across common data models. *J Clin Transl Sci.* 2024;8(1):e72. Epub 20240405. doi: 10.1017/cts.2024.500. PubMed PMID: 38690224; PubMed Central PMCID: PMC11058576.
681. Yang J, Schuemie MJ, Ji X, Suchard MA. Massive Parallelization of Massive Sample-size Survival Analysis. *J Comput Graph Stat.* 2024;33(1):289-302. Epub 20230626. doi: 10.1080/10618600.2023.2213279. PubMed PMID: 38716090; PubMed Central PMCID: PMC11070748.
682. Nguyen PA, Hsu MH, Chang TH, Yang HC, Huang CW, Liao CT, Lu CY, Hsu JC. Taipei Medical University Clinical Research Database: a collaborative hospital EHR database aligned with international common data standards. *BMJ Health Care Inform.* 2024;31(1). Epub 20240514. doi: 10.1136/bmjhci-2023-100890. PubMed PMID: 38749529; PubMed Central PMCID: PMC11097871.
683. Fridgerisson EA, Williams R, Rijnbeek P, Suchard MA, Reys JM. Comparing penalization methods for linear models on large observational health data. *J Am Med Inform Assoc.* 2024;31(7):1514-21. doi: 10.1093/jamia/ocae109. PubMed PMID: 38767857; PubMed Central PMCID: PMC11187433.
684. Burkard T, López-Güell K, Gorbachev A, Bellas L, Jödicke AM, Burn E, de Ridder M, Mosseveld M, Gratton J, Seager S, Vojinovic D, Mayer MA, Ramírez-Anguita JM, Machín AL, Oja M, Kolde R, Bonadt K, Prieto-Alhambra D, Reich C, Català M. Calculating daily dose in the Observational Medical Outcomes Partnership Common Data Model. *Pharmacoepidemiol Drug Saf.* 2024;33(6):e5809. doi: 10.1002/pds.5809. PubMed PMID: 38773798.
685. Schiffer-Kane K, Liu C, Callahan TJ, Ta C, Nestor JG, Weng C. Converting OMOP CDM to phenopackets: A model alignment and patient data representation evaluation. *J Biomed Inform.* 2024;155:104659. Epub 20240521. doi: 10.1016/j.jbi.2024.104659. PubMed PMID: 38777085; PubMed Central PMCID: PMC11181468.
686. Han M, Chang T, Chun HR, Jo S, Jo Y, Yu DH, Yoo S, Cho SI. Symptoms and Conditions in Children and Adults up to 90 Days after SARS-CoV-2 Infection: A Retrospective Observational Study Utilizing the Common Data Model. *J Clin Med.* 2024;13(10). Epub 20240515. doi: 10.3390/jcm13102911. PubMed PMID: 38792452; PubMed Central PMCID: PMC11122571.
687. Mateus P, Moonen J, Beran M, Jaarsma E, van der Landen SM, Heuvelink J, Birhanu M, Harms AGJ, Bron E, Wolters FJ, Cats D, Mei H, Oomens J, Jansen W, Schram MT, Dekker A, Bermejo I. Data harmonization and federated learning for multi-cohort dementia research using the OMOP common data model: A Netherlands consortium of dementia cohorts case study. *J Biomed Inform.* 2024;155:104661. Epub 20240526. doi: 10.1016/j.jbi.2024.104661. PubMed PMID: 38806105.
688. Essaid S, Andre J, Brooks IM, Hohman KH, Hull M, Jackson SL, Kahn MG, Kraus EM, Mandadi N, Martinez AK, Mui JY, Zambarano B, Soares A. MENDS-on-FHIR: leveraging the OMOP common data model and FHIR standards for national chronic disease surveillance. *JAMIA Open.* 2024;7(2):ooae045. Epub 20240529. doi: 10.1093/jamiaopen/ooae045. PubMed PMID: 38818114; PubMed Central PMCID: PMC11137321.
689. Wirth FN, Abu Attieh H, Prasser F. OHDSI-compliance: a set of document templates facilitating the implementation and operation of a software stack for real-world evidence generation. *Front Med (Lausanne).* 2024;11:1378866. Epub 20240516. doi: 10.3389/fmed.2024.1378866. PubMed PMID: 38818399; PubMed Central PMCID: PMC11137233.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Thru Aug 2024
38	14	16	24	29	30	46	79	112	124	100	107

690. Seinen TM, Kors JA, van Mulligen EM, Fridgeirsson EA, Verhamme KM, Rijnbeek PR. Using clinical text to refine unspecific condition codes in Dutch general practitioner EHR data. *Int J Med Inform.* 2024;189:105506. Epub 20240529. doi: 10.1016/j.ijmedinf.2024.105506. PubMed PMID: 38820647.
691. Rujano MA, Boiten JW, Ohmann C, Canham S, Contrino S, David R, Ewbank J, Filippone C, Connellan C, Custers I, van Nuland R, Mayrhofer MT, Holub P, Álvarez EG, Bacry E, Hughes N, Freeberg MA, Schaffhauser B, Wagener H, Sánchez-Pla A, Bertolini G, Panagiotopoulou M. Sharing sensitive data in life sciences: an overview of centralized and federated approaches. *Brief Bioinform.* 2024;25(4). doi: 10.1093/bib/bbae262. PubMed PMID: 38836701; PubMed Central PMCID: PMC11151787.
692. Gandaglia G, Pellegrino F, De Meulder B, Hijazy A, Abbott T, Golozar A, Nicoletti R, Gomez-Rivas J, Steinbeisser C, Evans-Axelsson S, Briganti A, N'Dow J. Research protocol for an observational health data analysis to assess the applicability of randomized controlled trials focusing on newly diagnosed metastatic prostate cancer using real-world data: PIONEER IMI's "big data for better outcomes" program. *Int J Surg Protoc.* 2024;28(2):64-72. Epub 20240415. doi: 10.1097/sp9.000000000000024. PubMed PMID: 38854711; PubMed Central PMCID: PMC11161292.
693. Barclay NL, Burkard T, Burn E, Delmestri A, Miquel Dominguez A, Golozar A, Guarner-Argente C, Avilés-Jurado FX, Man WY, Roselló Serrano À, Rosen AW, Tan EH, Tietzova I, Prieto Alhambra D, Newby D. The Impact of the COVID-19 Pandemic on Incidence and Short-Term Survival for Common Solid Tumours in the United Kingdom: A Cohort Analysis. *Clin Epidemiol.* 2024;16:417-29. Epub 20240611. doi: 10.2147/clep.S463160. PubMed PMID: 38882578; PubMed Central PMCID: PMC11179647.
694. Sibert NT, Soff J, La Ferla S, Quaranta M, Kremer A, Kowalski C. Transforming a Large-Scale Prostate Cancer Outcomes Dataset to the OMOP Common Data Model-Experiences from a Scientific Data Holder's Perspective. *Cancers (Basel).* 2024;16(11). Epub 20240530. doi: 10.3390/cancers16112069. PubMed PMID: 38893186; PubMed Central PMCID: PMC11171220.
695. Hoffmann K, Nesterow I, Peng Y, Henke E, Barnett D, Klengel C, Gruhl M, Bartos M, Nüßler F, Gebler R, Grummt S, Seim A, Bathelt F, Reinecke I, Wolfien M, Weidner J, Sedlmayr M. Streamlining intersectoral provision of real-world health data: a service platform for improved clinical research and patient care. *Front Med (Lausanne).* 2024;11:1377209. Epub 20240605. doi: 10.3389/fmed.2024.1377209. PubMed PMID: 38903818; PubMed Central PMCID: PMC11188485.
696. Schulz NA, Carus J, Wiederhold AJ, Johanns O, Peters F, Rath N, Rausch K, Hollecsek B, Katalinic A, Gundler C. Learning debiased graph representations from the OMOP common data model for synthetic data generation. *BMC Med Res Methodol.* 2024;24(1):136. Epub 20240622. doi: 10.1186/s12874-024-02257-8. PubMed PMID: 38909216; PubMed Central PMCID: PMC11193245.
697. Nateghi Haredasht F, Fouladvand S, Tate S, Chan MM, Yeow JLL, Griffiths K, Lopez I, Bertz JW, Miner AS, Hernandez-Boussard T, Chen CA, Deng H, Humphreys K, Lembke A, Vance LA, Chen JH. Predictability of buprenorphine-naloxone treatment retention: A multi-site analysis combining electronic health records and machine learning. *Addiction.* 2024. Epub 20240624. doi: 10.1111/add.16587. PubMed PMID: 38923168.
698. Seinen TM, Kors JA, van Mulligen EM, Rijnbeek PR. Annotation-preserving machine translation of English corpora to validate Dutch clinical concept extraction tools. *J Am Med Inform Assoc.* 2024;31(8):1725-34. doi: 10.1093/jamia/ocae159. PubMed PMID: 38934643; PubMed Central PMCID: PMC11258409.
699. Park G, Lee Y, Cho M. Enhancing healthcare process analysis through object-centric process mining: Transforming OMOP common data models into object-centric event logs. *J Biomed Inform.* 2024;156:104682. Epub 20240627. doi: 10.1016/j.jbi.2024.104682. PubMed PMID: 38944260.
700. Patterson J, Tatonetti N. KG-LIME: predicting individualized risk of adverse drug events for multiple sclerosis disease-modifying therapy. *J Am Med Inform Assoc.* 2024;31(8):1693-703. doi: 10.1093/jamia/ocae155. PubMed PMID: 38964369.
701. Shang Y, Tian Y, Lyu K, Zhou T, Zhang P, Chen J, Li J. Electronic Health Record-Oriented Knowledge Graph System for Collaborative Clinical Decision Support Using Multicenter Fragmented Medical Data: Design and Application Study. *J Med Internet Res.* 2024;26:e54263. Epub 20240705. doi: 10.2196/54263. PubMed PMID: 38968598; PubMed Central PMCID: PMC11259764.
702. Jeon K, Park WY, Kahn CE, Jr., Nagy P, You SC, Yoon SH. Advancing Medical Imaging Research Through Standardization: The Path to Rapid Development, Rigorous Validation, and Robust Reproducibility. *Invest Radiol.* 2024. Epub 20240711. doi: 10.1097/rli.0000000000001106. PubMed PMID: 38985896.
703. Ji H, Kim S, Sunwoo L, Jang S, Lee HY, Yoo S. Integrating Clinical Data and Medical Imaging in Lung Cancer: Feasibility Study Using the Observational Medical Outcomes Partnership Common Data Model Extension. *JMIR Med Inform.* 2024;12:e59187. Epub 20240712. doi: 10.2196/59187. PubMed PMID: 38996330; PubMed Central PMCID: PMC11282389.
704. Smith LH, Cavanaugh R. *allofus*: an R package to facilitate use of the All of Us Researcher Workbench. *J Am Med Inform Assoc.* 2024. Epub 20240724. doi: 10.1093/jamia/ocae198. PubMed PMID: 39043402.
705. von Gerich H, Chomutare T, Peltonen LM. Building Bridges for Federated Learning in Healthcare: Review on Approaches for Common Data Model Development. *Stud Health Technol Inform.* 2024;315:711-2. doi: 10.3233/shoti240292. PubMed PMID: 39049393.
706. Mehta N, Ribeyre BB, Dimitrov L, English LJ, Ewart C, Heinrich A, Joshi N, Munro KJ, Roadknight G, Romao L, Schilder AG, Spriggs RV, Norris R, Ross T, Tilston G. Creating a health informatics data resource for hearing health research. *BMC Med Inform Decis Mak.* 2024;24(1):209. Epub 20240729. doi: 10.1186/s12911-024-02589-x. PubMed PMID: 39075459; PubMed Central PMCID: PMC11285202.
707. John LH, Fridgeirsson EA, Kors JA, Reys JM, Williams RD, Ryan PB, Rijnbeek PR. Development and validation of a patient-level model to predict dementia across a network of observational databases. *BMC Med.* 2024;22(1):308. Epub 20240729. doi: 10.1186/s12916-024-03530-9. PubMed PMID: 39075527; PubMed Central PMCID: PMC11288076.
708. Amadi D, Kiwuwa-Muyingo S, Bhattacharjee T, Taylor A, Kiragga A, Ochola M, Kanjala C, Gregory A, Tomlin K, Todd J, Greenfield J. Making Metadata Machine-Readable as the First Step to Providing Findable, Accessible, Interoperable, and Reusable Population Health Data: Framework Development and Implementation Study. *Online J Public Health Inform.* 2024;16:e56237. Epub 20240801. doi: 10.2196/56237. PubMed PMID: 39088253; PubMed Central PMCID: PMC11327634.
709. Fruchart M, Quindroit P, Jacquemont C, Beuscart JB, Calafiore M, Lamer A. Transforming Primary Care Data Into the Observational Medical Outcomes Partnership Common Data Model: Development and Usability Study. *JMIR Med Inform.* 2024;12:e49542. Epub 20240813. doi: 10.2196/49542. PubMed PMID: 39140273; PubMed Central PMCID: PMC11337138.
710. Ahmadi N, Zoch M, Guengoeze O, Facchinello C, Mondorf A, Stratmann K, Musleh K, Erasmus HP, Tchertov J, Gebler R, Schaaf J, Frischen LS, Nasirian A, Dai J, Henke E, Tremblay D, Srisuwananukorn A, Bornhäuser M, Röllig C, Eckardt JN, Middeke JM, Wolfien M, Sedlmayr M. How to customize common data models for rare diseases: an OMOP-based implementation and lessons learned. *Orphanet J Rare Dis.* 2024;19(1):298. Epub 20240814. doi: 10.1186/s13023-024-03312-9. PubMed PMID: 39143600; PubMed Central PMCID: PMC11325822.

>2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	This Aug 2024
38	14	16	24	29	30	46	79	112	124	108	107

711. Trinh NT, Houghtaling J, Bernal FL, Hayati S, Maglanoc LA, Lupattelli A, Halvorsen L, Nordeng HM. Harmonizing Norwegian registries onto OMOP common data model: Mapping challenges and opportunities for pregnancy and COVID-19 research. *Int J Med Inform.* 2024;191:105602. Epub 20240814. doi: 10.1016/j.ijmedinf.2024.105602. PubMed PMID: 39153282.

712. Barclay NL, Burn E, Delmestri A, Duarte-Salles T, Golozar A, Man WY, Tan EH, Tietzova I, Prieto-Alhambra D, Newby D. Trends in incidence, prevalence, and survival of breast cancer in the United Kingdom from 2000 to 2021. *Sci Rep.* 2024;14(1):19069. Epub 20240817. doi: 10.1038/s41598-024-69006-1. PubMed PMID: 39153995; PubMed Central PMCID: PMC11330450.

713. French MA, Hartman P, Hayes HA, Ling L, Magel J, Thackeray A. Coverage of physical therapy assessments in the Observational Medical Outcomes Partnership Model common data model. *Appl Clin Inform.* 2024. Epub 20240822. doi: 10.1055/a-2401-3688. PubMed PMID: 39174009.

714. Hahn W, Ahmadi N, Hoffmann K, Eckardt JN, Sedlmayr M, Wolfien M. Synthetic Data Generation in Hematology - Paving the Way for OMOP and FHIR Integration. *Stud Health Technol Inform.* 2024;316:1472-6. doi: 10.3233/shti240692. PubMed PMID: 39176482.

715. Thiel J, Nesterow I, Sedlmayr M, Weidner J, Henke E. Towards Efficient Resource Utilization Forecasting in Acute Heat Events Using OMOP. *Stud Health Technol Inform.* 2024;316:1555-9. doi: 10.3233/shti240715. PubMed PMID: 39176503.

716. Popoff B, Delange B, Kallout J, Cuggia M, Clavier T, Bouzille G. How to Accurately Detect Renal Replacement Therapy Weaning in Intensive Care: Data Quality and Standardization Considerations for the OMOP Common Data Model. *Stud Health Technol Inform.* 2024;316:1584-8. doi: 10.3233/shti240724. PubMed PMID: 39176511.

717. Delange B, Bouzille G, Popoff B, Pierre-Jean M, Maamar A, Cuggia M. Intensive Care Quality Indicators Dashboard Using Observational Medical Outcomes Partnership Common Data Model. *Stud Health Technol Inform.* 2024;316:1605-6. doi: 10.3233/shti240730. PubMed PMID: 39176517.

718. Reis JA, Almeida JR, Almeida TM, Oliveira JL. A Chatbot-Like Platform to Enhance the Discovery of OMOP CDM Databases. *Stud Health Technol Inform.* 2024;316:1689-93. doi: 10.3233/shti240748. PubMed PMID: 39176535.

719. Gyrard A, Gribbon P, Hussein R, Abedian S, Bonmati LM, Cabornero GL, Manias G, Danciu G, Dalmiani S, Autexier S, van Nuland R, Jendrossek M, Avramidis I, Alvarez EG. Synergies Among Health Data Projects with Cancer Use Cases Based on Health Standards. *Stud Health Technol Inform.* 2024;316:1292-6. doi: 10.3233/shti240649. PubMed PMID: 39176618.

720. Papapostolou G, Chytas A, Rekkas A, Bigaki M, Zeimpekis D, Dermentzoglou L, Tortopidis G, Natsiavas P. Real-World Data in Greece: Mapping the Papageorgiou General Hospital Data to the OMOP Common Data Model. *Stud Health Technol Inform.* 2024;316:1324-5. doi: 10.3233/shti240656. PubMed PMID: 39176625.

721. El Ghosh M, Kalokyri V, Sambres M, Vaterkowski M, Duclos C, Tannier X, Tsakou G, Tsiknakis M, Daniel C, Dhombres F. From Syntactic to Semantic Interoperability Using a Hyperontology in the Oncology Domain. *Stud Health Technol Inform.* 2024;316:1385-9. doi: 10.3233/shti240670. PubMed PMID: 39176639.

722. Chytas A, Bassileiades N, Natsiavas P. Mapping OMOP-CDM to RDF: Bringing Real-World-Data to the Semantic Web Realm. *Stud Health Technol Inform.* 2024;316:1406-10. doi: 10.3233/shti240674. PubMed PMID: 39176643.

723. Albarran R, Lamy JB. Enhancing Healthcare Informatics: Integrating Category Theory Reasoning into OMOP-CDM Ontology Model. *Stud Health Technol Inform.* 2024;316:1427-31. doi: 10.3233/shti240680. PubMed PMID: 39176649.

724. Bracons Cucó G, Gil Rojas J, Peñafiel Macias P, Borrat Frigola X, Lymperidou A, Martínez-González J, Labarga A, Frid S. OntoBridge Versus Traditional ETL: Enhancing Data Standardization into CDM Formats Using Ontologies Within the DATOS-CAT Project. *Stud Health Technol Inform.* 2024;316:1432-6. doi: 10.3233/shti240681. PubMed PMID: 39176650.

725. Jathissa P, Rohatsch L, Sauermann S, Hussein R. OMOP-on-FHIR: A FHIR Server Development to Facilitate Data Interaction with the OMOP-CDM and FHIR for PGHD. *Stud Health Technol Inform.* 2024;316:157-8. doi: 10.3233/shti240367. PubMed PMID: 39176696.

726. Lymperidou A, Martínez-González J, Bracons Cucó G, Frid S, de Cid R, Labarga A. DATOS-CAT: OMOP-Common Data Model for the Standardization, Integration and Analysis of Population-Based Biomedical Data in Catalonia. *Stud Health Technol Inform.* 2024;316:200-1. doi: 10.3233/shti240378. PubMed PMID: 39176707.

727. Santos RL, Cruz-Correia R. Improving Healthcare Quality with a LHS: From Patient-Generated Health Data to Evidence-Based Recommendations. *Stud Health Technol Inform.* 2024;316:230-4. doi: 10.3233/shti240387. PubMed PMID: 39176716.

728. Krastev E, Krasteva R, Fazli M, Tcharaktchiev D. Dementia and Alzheimer's Disease Prevalence in Bulgaria During 2018: Nationally Representative Study. *Stud Health Technol Inform.* 2024;316:262-6. doi: 10.3233/shti240394. PubMed PMID: 39176723.

729. Katsch F, Hussein R, Duftschmid G. Converting Entity-Attribute-Value Data Sources to OMOP's CDM: Lessons Learned. *Stud Health Technol Inform.* 2024;316:356-7. doi: 10.3233/shti240419. PubMed PMID: 39176749.

730. Berman L, Ostchega Y, Giannini J, Anandan LP, Clark E, Spotnitz M, Sulieman L, Volynski M, Ramirez A. Application of a Data Quality Framework to Ductal Carcinoma In Situ Using Electronic Health Record Data From the All of Us Research Program. *JCO Clin Cancer Inform.* 2024;8:e2400052. doi: 10.1200/cci.24.00052. PubMed PMID: 39178364.

731. Hussein R, Balaur I, Burmann A, Ówiek-Kupczyńska H, Gadiya Y, Ghosh S, Jayathissa P, Katsch F, Kremer A, Lähteenmäki J, Meng Z, Morasek K, R CR, Satagopam V, Sauermann S, Scheider S, Stamm T, Muehlendyck C, Gribbon P. Getting ready for the European Health Data Space (EHDS): IDERHA's plan to align with the latest EHDS requirements for the secondary use of health data. *Open Res Eur.* 2024;4:160. Epub 20240730. doi: 10.12688/openreseurope.18179.1. PubMed PMID: 39185338; PubMed Central PMCID: PMC11342032.

732. Khera R, Aminorroaya A, Dhingra LS, Thangaraj PM, Pedrosa Camargos A, Bu F, Ding X, Nishimura A, Anand TV, Arshad F, Blacketer C, Chai Y, Chattopadhyay S, Cook M, Dorr DA, Duarte-Salles T, DuVall SL, Falconer T, French TE, Hanchrow EE, Kaur G, Lau WCY, Li J, Li K, Liu Y, Lu Y, Man KKC, Matheny ME, Mathioudakis N, McLeggon JA, McLemore MF, Minty E, Morales DR, Nagy P, Ostropolets A, Pistillo A, Phan TP, Pratt N, Reyes C, Richter L, Ross JS, Ruan E, Seager SL, Simon KR, Viernes B, Yang J, Yin C, You SC, Zhou JJ, Ryan PB, Schuemie MJ, Krumholz HM, Hripcsak G, Suchard MA. Comparative Effectiveness of Second-Line Antihyperglycemic Agents for Cardiovascular Outcomes: A Multinational, Federated Analysis of LEGEND-T2DM. *J Am Coll Cardiol.* 2024;84(10):904-17. doi: 10.1016/j.jacc.2024.05.069. PubMed PMID: 39197980.

733. Choi S, Kim JK, Lee J, Choi SJ, Lee YK. Limitations of NHIC claim code-based surveillance and the necessity of UDI implementation in Korea. *Sci Rep.* 2024;14(1):21014. Epub 20240909. doi: 10.1038/s41598-024-72063-1. PubMed PMID: 39251861; PubMed Central PMCID: PMC11383859.

734. Cha JJ, Yum Y, Kim YH, Kim EJ, Rah YC, Park E, Im GJ, Song JJ, Chae SW, Choi J, Joo HJ. Association of the protective effect of telmisartan on hearing loss among patients with hypertension. *Front Neurol.* 2024;15:1410389. Epub 20240827. doi: 10.3389/fneur.2024.1410389. PubMed PMID: 39258156; PubMed Central PMCID: PMC11384575.

735. Sato A, Rodriguez-Molina D, Yoshikawa-Ryan K, Yamashita S, Okami S, Liu F, Farjat A, Oberprieler NG, Kovsedy CP, Kanasaki K, Vizcaya D. Early Clinical Experience of Finerenone in People with Chronic Kidney Disease and Type 2 Diabetes in Japan-A Multi-Cohort Study from the FOUNTAIN (Finerenone mUltidatabase NeTwork for Evidence generAtIoN) Platform. *J Clin Med.* 2024;13(17). Epub 20240828. doi: 10.3390/jcm131715107. PubMed PMID: 39274317.

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OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

X. Join The Journey



Building Community, One Lego At A Time

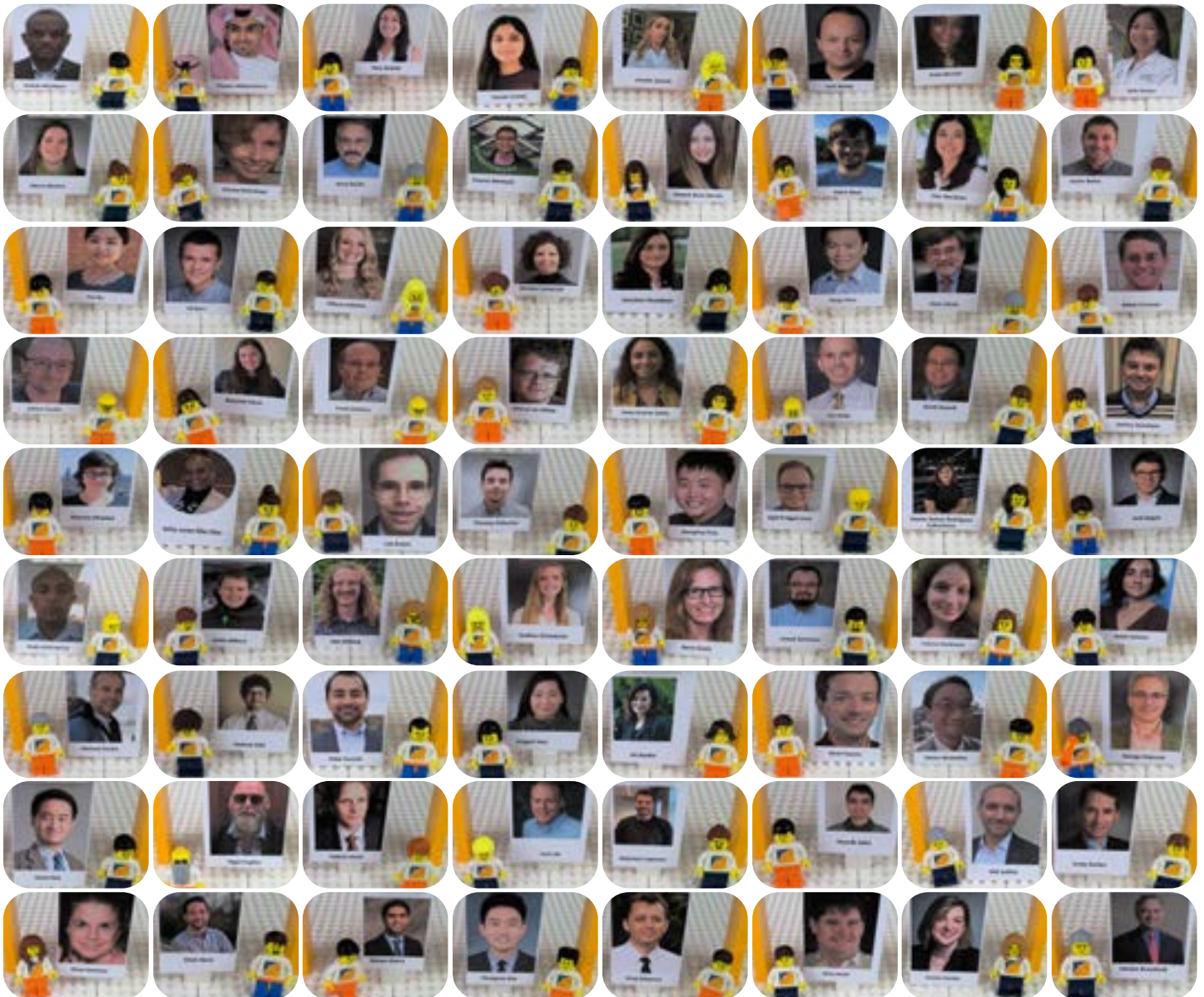
The term ‘community’ is defined in the *Oxford Dictionary* as ‘a feeling of fellowship with others, as a result of sharing common attitudes, interests, and goals.’

Improving health by empowering a community to collaboratively generate the evidence that promotes better health decisions and better care — the OHDSI mission — is not a one-person endeavor. It isn’t a one-company, one-country, one-stakeholder, one-discipline, one-anything endeavor.

The challenge is too great. The stakes are too high.

Open science is a team effort, and the OHDSI community knows that success can only occur if we come together and build upon each other’s strengths and passions. This message was at the heart of the 2022 Global Symposium closing, as small sets of individual legos were passed out to the hundreds of collaborators who came together. Small sections were built, and they were nice. When all pieced together, they formed something nobody expected beforehand.

That is the OHDSI belief: What would be unimaginable alone, we build together.







Patrick Ryan has provided the closing talk at the annual OHDSI Global Symposiums. Naturally, we figured the appropriate way to end this annual report was a closing letter from Patrick. Thank you for Joining The Journey with OHDSI!

Bill Gates is often credited with paraphrasing Amara’s law: “We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten.”

I am admittedly not the most patient person and often get frustrated with how slowly things change. Each year when we set our objectives and key results (OKRs), I question if we are being ambitious enough. Each year, I feel unsatisfied with our progress.

As OHDSI celebrates 10 years, it is important to reflect on how far we’ve come, and to look forward to the journey ahead.

When we held our first in-person OHDSI collaborator meeting at Columbia University in 2014, there were fewer than 50 participants. I never imagined that 10 years later, we’d have a thriving community of over 4,200 members, host events across the globe—from Sydney and Rotterdam to Singapore and Mumbai. I didn’t foresee that our annual Global Symposium would bring together more than 400 people from 20+ countries. I didn’t expect that we’d establish National Nodes in 13 European countries, or grow a network of over 60 medical centers in South Korea.

When OMOP CDM version 5 was released in 2014, we celebrated contributions from 16 organizations and saw 58 databases adopt the standard. Today, more than 540 data sources across 54 countries have transformed their data into OMOP CDM format, covering patient-level data from electronic health records, administrative claims, hospital systems, clinical registries, and biobanks.

Open-source development has been a pillar of our community from Day 1. In 2014 we

were proud to release tools like WhiteRabbit for ETL, ACHILLES for database characterization, and CYCLOPS for large-scale regression. I never dreamed that one decade later, we'd have an entire ecosystem of standardized tools, with over 800,000 downloads of HADES packages, empowering researchers around the world to conduct robust observational analyses.

The impact of our community on education has been profound. When we offered the first set of tutorials to a roomful of students at the 2016 OHDSI Symposium, we had no idea that OHDSI would become a cornerstone in the curricula of leading academic institutions. We are shaping undergraduate, Master's, and PhD programs with focus on 'real-world evidence' and 'data science'—concepts that were barely mentioned 10 years ago. We have seen trainees grow through our scientific innovations, and then we have seen those trainees lead methodological research that has advanced both causal inference and machine learning. The Book of OHDSI has grown into a community textbook used by over 2,000 people each month, and the EH DEN Academy has provided free educational resources to more than 5,000 learners in over 100 countries. These materials served as the basis to certify 64 small to medium-sized enterprises (SMEs) with the skills to support organizations to standardize data to the OMOP CDM and build technical infrastructures to enable standardized analytics.

At our onset, we knew we wanted OHDSI to be a research community that aspired to do more than improve the reliability of the evidence generation process. We aimed to generate and disseminate reliable evidence. 10 years later, we have produced a list of over 730 peer-reviewed publications, including OHDSI network study results featured in JAMA, Lancet, BMJ and JACC, among other clinical journals.

From the beginning, I had hoped that we would produce actionable information to support the clinical community making treatment decisions, as we've now done at scale for hypertension and diabetes. But I didn't anticipate 10 years ago that we would face a global pandemic, or that real-world evidence generated by our community would play such an integral role in supporting regulators and policy makers as we learned about COVID-19 natural history and monitored the safety and effectiveness of COVID-19 vaccines and purported treatments.

At that initial 2014 OHDSI event, we proposed a vision for our community: "OHDSI collaborators access a network of 1 billion patients to generate evidence about all



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aspects of healthcare. Patients and clinicians and other decision-makers around the world use OHDSI tools and evidence every day.” George highlighted this vision in our first OHDSI community paper from MEDINFO 2015.

Some called this vision too ambitious, and we later refined it to: “A world in which observational research produces a comprehensive understanding of health and disease.” But as we look back, the original goal doesn’t seem so far-fetched anymore.



Together, our community has built the world’s largest network of observational data. We have generated evidence across a wide range of healthcare areas—from cardiovascular disease and oncology to women’s health and vision care. With the OHDSI Evidence Network, we will continue to improve how OHDSI collaborators can access the distributed network and expand the scale of the evidence we produce.

Together, our community has developed tools that enable all stakeholders to take part in the journey from data to evidence, and we see our colleagues from industry, academia, and regulatory agencies around the world embedding these tools into their daily operations. Hardly a day goes by when I’m not designing a cohort in ATLAS, reviewing results in an OHDSI Shiny viewer, or just hacking SQL against the OMOP CDM. I know I’m not alone.

Looking ahead, it’s no longer a question of “if” we will achieve our vision, but rather “how” we will maximize our impact on healthcare now that we’re here. To motivate all of us to think big about the opportunity in front of us, here are some of targets that may be overly ambitious for the next year, but are hopefully an underestimation for where we’ll be in 2034:

- OHDSI’s open science community approach to evidence generation becomes the expected behavior across stakeholders and disciplines to promote innovation, reproducibility, and collaboration.
- The OMOP Common Data Model will evolve and become recognized as the preferred international data standard for real-world evidence generation, will be seamlessly interoperable with complementary clinical data exchange standards, and will be consistently adopted across academia, industry, and government around the world.
- The number of unique data sources adopting the OMOP CDM will exceed 50,000, but organizations will also use the CDM as a mechanism to partner to advance cross-organizational data linkage and participatory patient self-reporting. This will increase the completeness and longitudinal continuity of patient records, enable connections across

familial generations, and improve the fitness-of-use for each integrated source across a broader set of analytic use cases.

- The OHDSI Standardized Vocabularies will provide the singular resource that maps all source terminologies and unstructured medical text into a common reference ontology, with real-time updating to reflect the current state of knowledge in medicine.

- Every organization collecting patient-level data during the routine course of clinical care will have established systems to standardize the data to the OMOP CDM using the latest OHDSI standardized vocabularies on a nightly basis, enabling daily reporting for disease surveillance and quality improvement.

- The OHDSI community will prove that real world evidence from real world data—when adhering OHDSI’s best practices and passing all objective diagnostics—can be considered just as reliable as evidence from randomized clinical trials. Open-source systems that follow these practices will become trusted by health systems, payers, and regulators for guiding clinical care and policy decisions.

- Advances in OHDSI’s open-source analytic platform will decrease the time to generate reliable real-world evidence across the OHDSI distributed network; this process will be measured in minutes, not months.

- The OHDSI Evidence Network will make it both commonplace and expected to see hundreds of databases, representing hundreds of millions of patients, be represented in network studies of every important public health question. This would ensure that the evidence we generate is replicable within similar populations and generalizable to patients across North and South America, Europe, Africa, Asia and Australia.



- The OHDSI community will represent and support all clinical subspecialties, and will become the primary source of real-world evidence to proactively fill evidence gaps needed to inform clinical guidelines around management of every disease.

- The OHDSI community will design, implement, and deliver results from more than 10,000 network studies, with the majority of research questions coming directly from

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patients and clinicians seeking reliable evidence to address their needs at the point-of-care.

- Discoveries across the OHDSI network about unrecognized effects of existing medical interventions will yield new indications that achieve regulatory approval due to the robustness of the real-world evidence produced within our community.

- OHDSI will freely disseminate its evidence through more than 100,000 scholarly publications, but it will also establish new modalities for evidence dissemination to more directly support clinical practice.

- Every disease will have a comprehensive real-world evidence summary that characterizes natural history and treatment pathways across the globe so we can understand patient heterogeneity, promote health equity, and recognize unmet medical needs.

- Every medical product will have a comprehensive real-world evidence surveillance summary from OHDSI that provides characterization of the incidence of all outcomes, population-level estimation of the causally attributable risk of each outcome and comparative effectiveness with all alternative treatments, and patient-level prediction models so that individuals can accurately determine their personalized risk given their medical history.

- OHDSI evidence repositories will become the primary source of knowledge underpinning foundational models to promote better health decisions and better care.



If we can get all that done, then maybe I'll be satisfied.

If we all work together, then I know I'll enjoy the journey.

-Patrick Ryan



Our community has set both the foundation and the highest of standards for global collaboration around observational research. We continue to make real differences in healthcare, and we are doing it through transparent and reproducible science. We also recognize that there is so much more to be done, and so much more that we can do.

If you are inspired by what you read in this book, if you want to learn more about methods research or open-source development, if you have a clinical question you believe needs answering, or if you want to join a community of people dedicated to the team sport of observational health data sciences and informatics, we have a place for you.

How can you get started?

Join The OHDSI Forums (forums.ohdsi.org)

Connect with other OHDSI collaborators on our community forums and start discussing how you can help us inform medical decision-making, or simply follow discussions that are interesting to you and learn about the work happening within our global community.

Join Our Workgroups & MS Teams Environment (ohdsi.org/ohdsi-workgroups)

Our workgroups present opportunities for all community members to find a home for their talents and passions, and a place to make meaningful contributions. We are always looking for new collaborators. Learn more by checking out the workgroups homepage Our workgroups collaborate inside the OHDSI MS Teams environment; a form to join our Teams environment is available here: bit.ly/Join-OHDSI-Teams.

Join Our Community Calls (ohdsi.org/community-calls)

Join collaborators around the world each week during our OHDSI Community Call, held Tuesdays at 11 am ET within our Teams environment. Following weekly updates, we have a variety of call formats, including research presentations, workgroup updates, discussions, tutorials, debates and more. These calls are recorded, and you can access them (as well as the meeting link) at our Community Calls page.

Continue To Learn About OHDSI

Learn about OHDSI tools and research processes in a variety of ways.

- The OHDSI website keeps you informed of recent news, publications, upcoming studies and more, while providing all critical links needed to help with your journey: ohdsi.org
- The Book of OHDSI (which is also translated into both Korean and Chinese) is a community-developed resource with information for every step of your journey: ohdsi.github.io/TheBookOfOhdsi
- Check out the EH DEN Academy, a set of free, on-demand training and development courses. These are open to anybody, but we always encourage new OHDSI collaborators to use this resource to learn about best practices towards our mission of improving health by empowering a community to collaboratively generate evidence that promotes better health decisions and better care: academy.ehden.eu
- Check out the OHDSI YouTube page (youtube.com/c/OHDSI) for many community-developed learning resources, including tutorials, research presentations and more. Follow OHDSI on LinkedIn ([OHDSI](https://www.linkedin.com/company/ohdsi)), Twitter/X ([@OHDSI](https://twitter.com/OHDSI)) and Instagram ([@OHDSI](https://www.instagram.com/OHDSI)) and to keep updated on community research and follow the [#OHDSISocialShowcase](https://twitter.com/OHDSISocialShowcase) to see the research shared at our annual symposia.

Join The Journey

Your journey with OHDSI has started. Your interest in our global community is the first step in making a difference in global health. There is no limit to the impact you can make, and you can do so in a supportive, positive and fun environment. We invite you to search our website, post to the forum, join us in Teams, check out our GitHub (github.com/OHDSI), or reach out to us over email (contact@ohdsi.org).

Thank you for Joining The Journey with OHDSI!



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