



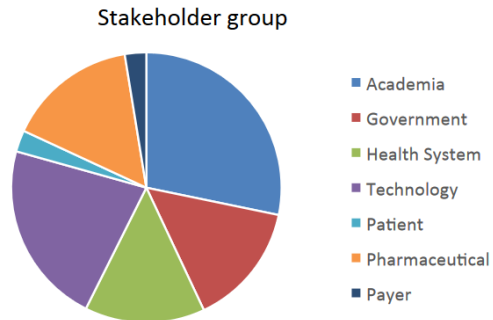
OHDSI/OMOP Introduction

Bangkok, Thailand

April 24, 2024

What OHDSI is:

- ✓ **Open Source**
- ✓ **Community**
- ✓ **Data**



Why Choose OHDSI/OMOP:

- ✓ **Fast, reliable** studies across a series of datasets and data types
- ✓ **Reduced cost of ownership** including understanding coding schemes, writing statistical programs across databases or developing software
- ✓ **Expanded data access** via the OHDSI network and remote multi-center database studies



OHDSI Collaborators:

- 3,758 collaborators
- >1,100 organizations
- 83 countries from 6 continents

OHDSI Network:

- 534 data sources
- 49 countries
- 956M unique patient records

<https://ohdsi.org/>



OHDSI's Mission

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



History of OMOP/OHDSI

Global Acceptance



End of OMOP Experiment

Main findings in OMOP experiment

- Heterogeneity in estimates due to choice of database
- Heterogeneity in estimates due to analysis choices
- Except little heterogeneity due to outcome definitions
- Good performance (AUC > 0.7) in distinguishing positive from negative controls for optimal methods when stratifying by outcome and restricting to powered test cases
- Self controlled methods perform best for all outcomes

First OHDSI Symposium/
Network Study Published

First Hackathon
at Columbia University

European Chapter

FDA Adoption
(FDA BEST Launch)

EMA Adoption

Australia, Japan Chapters



India Chapter



2013

2015

2017

2019

2022

2009

2014

2016

2018

2020

2023

OMOP Experiment #1

Launch of OHDSI

China Chapter

EHDEN Initiation (Europe)

OHDSI COVID-19
Study-a-Thon

OMOP in Thailand

Thailand (1)
Siriraj Hospital EHR



Korea Chapter



FEEDER-NET Initiation (Korea)

First European Symposium

Singapore, Taiwan Chapters



OMOP Experiment 1 (2009-2010)

- 10 data sources
- Claims and EHRs
- 200M+ lives

Common Data Model

- Open source
- Standards based

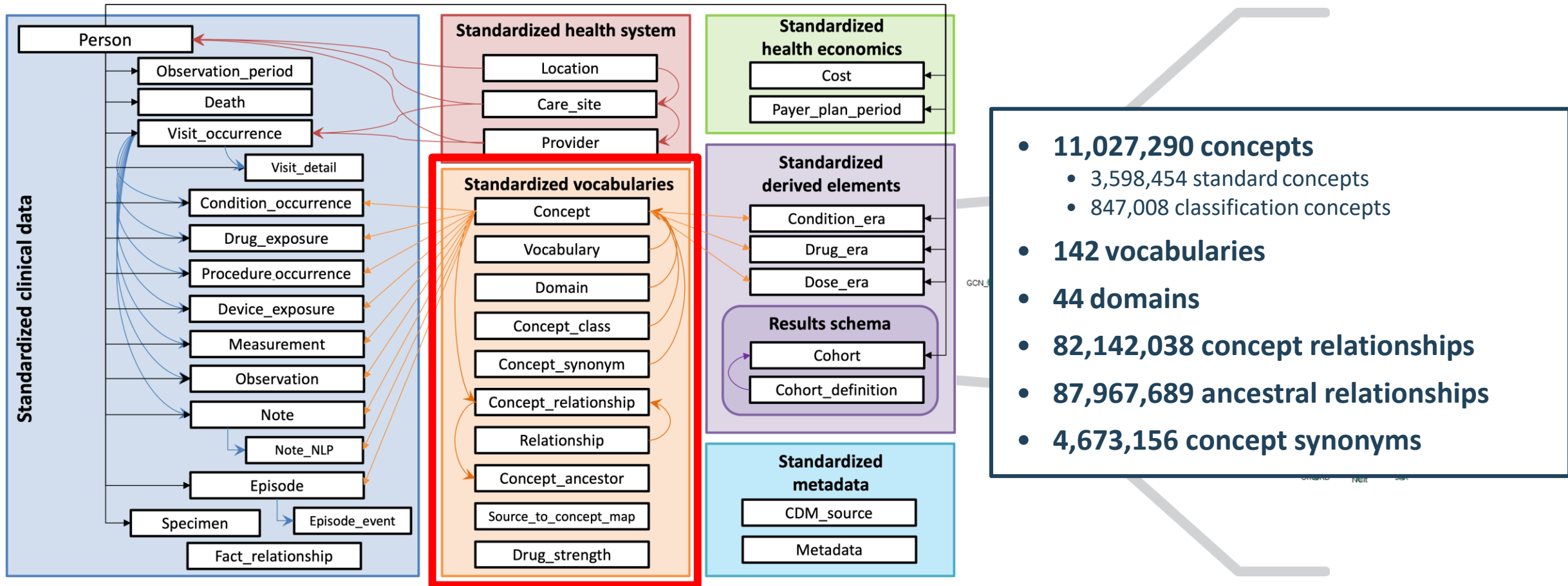
OMOP Methods Library

- 18 methods
- Epidemiology designs
- Statistical approaches adapted for longitudinal data



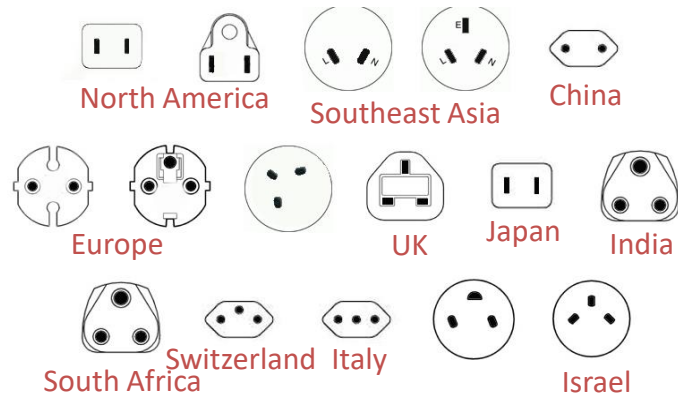
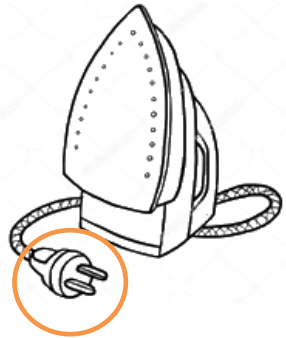
OMOP Common Data Model (CDM)

Ontologies are critical when designing data models

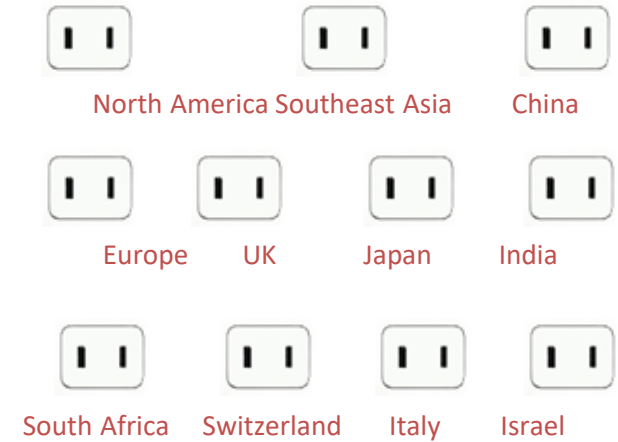


Data Standardization to OMOP Enables Systematic Research

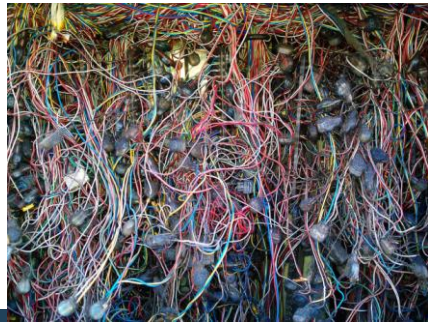
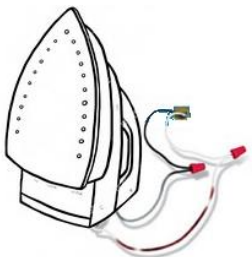
Analytical method:
Adherence to Drug



OMOP
CDM



One SAS or R script
for each study



- Reliant on partner capabilities
- Not scalable
- Not transparent
- Expensive
- Slow
- Prohibitive to non-expert routine use

Adherence

Mortality

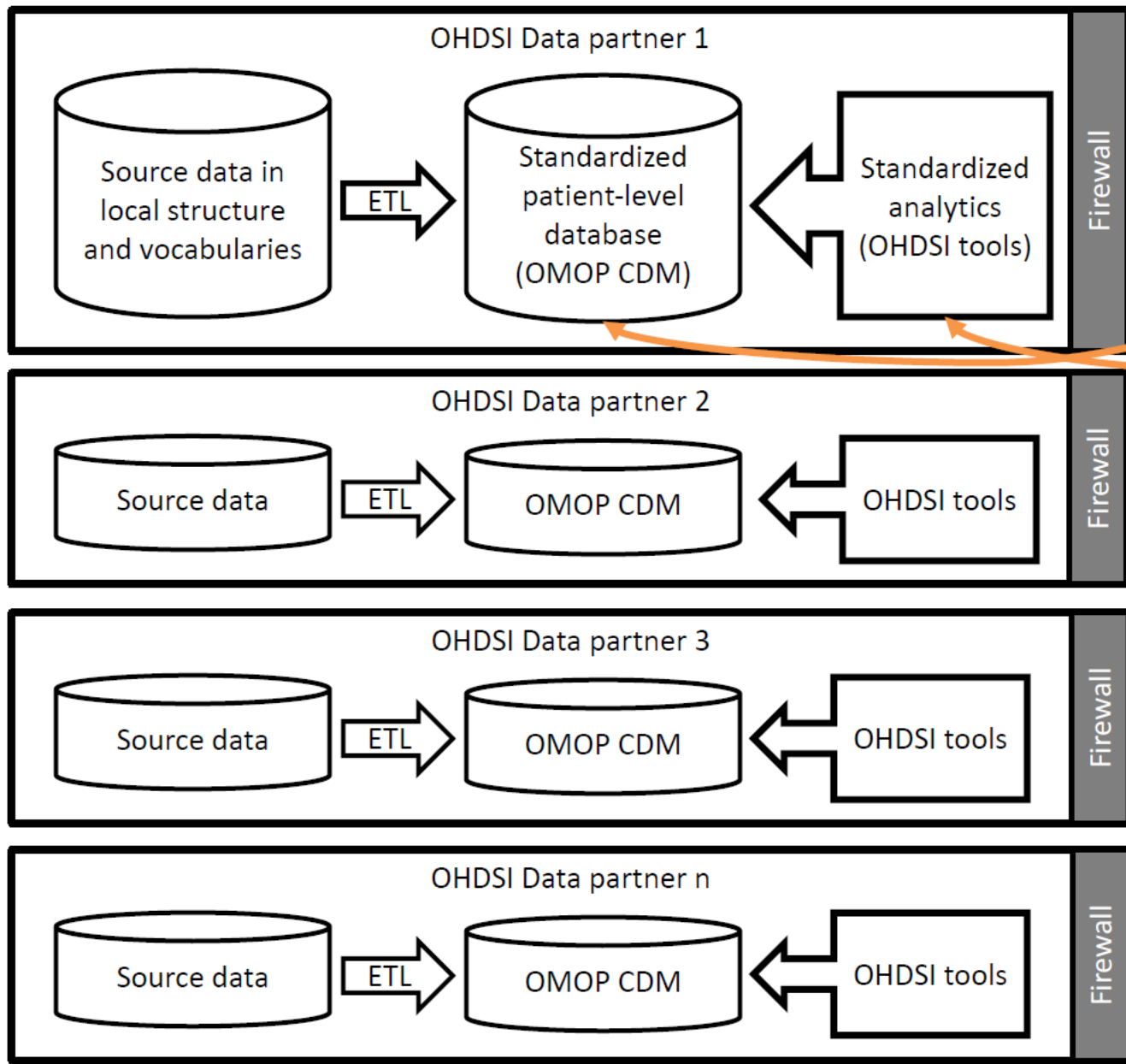
Prediction

OHDSI
tools

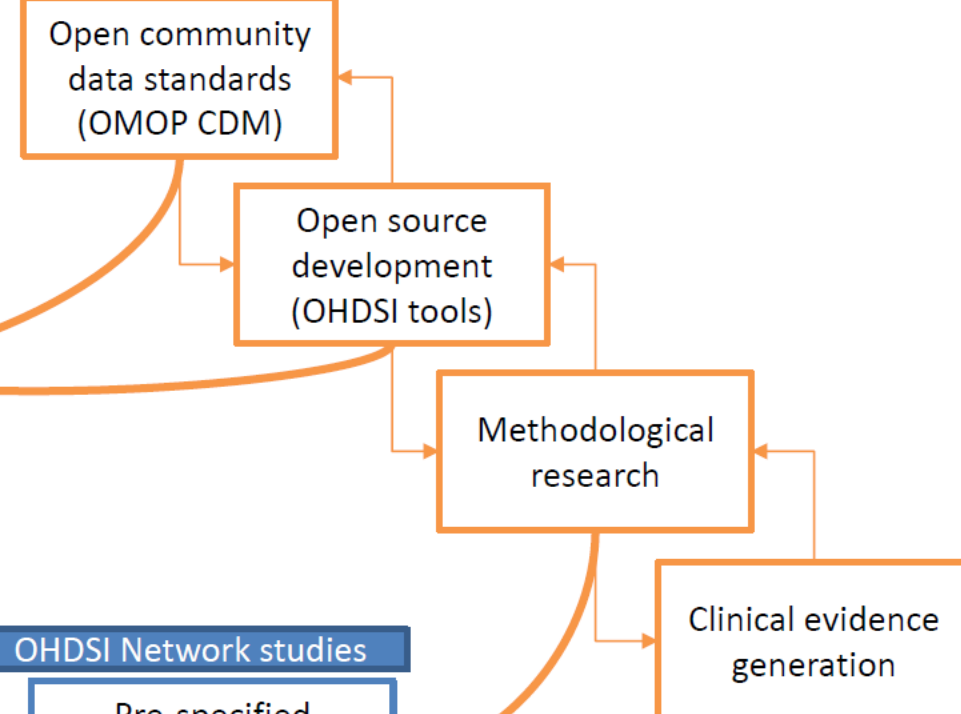


Safety
Signals

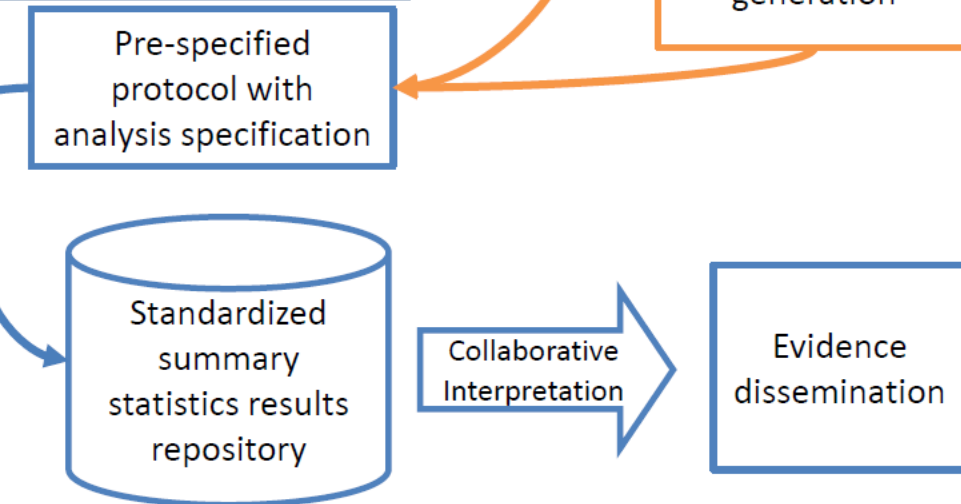
OHDSI data network



OHDSI collaborations



OHDSI Network studies





Health Analytics Data-to-Evidence (HADES)

Suite of OHDSI R packages for running standardized analytics against OMOP data assets



Overview

- R packages that can run against any OMOP database
- Support R packages
 - DatabaseConnector
 - SqlRender
 - ROhdsiWebApi
 - CohortDiagnostics
- Analytical R packages
 - PatientLevelPrediction
 - CohortMethod (comparative effectiveness)
 - FeatureExtraction (characterization)
 - SelfControlledCaseSeries

HADES
HEALTH ANALYTICS DATA-TO-EVIDENCE SUITE

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...	ROhdsiWebApi Interact with OHDSI WebAPI web services. Learn more...	OhdsiSharing Securely sharing (large) files between OHDSI collaborators. Learn more...
MethodEvaluation Use real data and established reference sets as well as simulations injected in real data to evaluate the performance of methods. Learn more...	CohortDiagnostics Generate a wide set of diagnostics to evaluate cohort definitions against databases in the CDM. Learn more...	Hydra Hydrating package skeletons into executable R study packages based on specifications in JSON format. Learn more...	Eunomia A standard CDM dataset for testing and demonstration purposes that runs on an embedded SQLite database. Learn more...	CirceR An R wrapper for Circe, a library for creating cohort definitions, expressing them as JSON, SQL, or Markdown. Learn more...

<https://ohdsi.github.io/Hades/index.html>



Data relevance across clinical domains

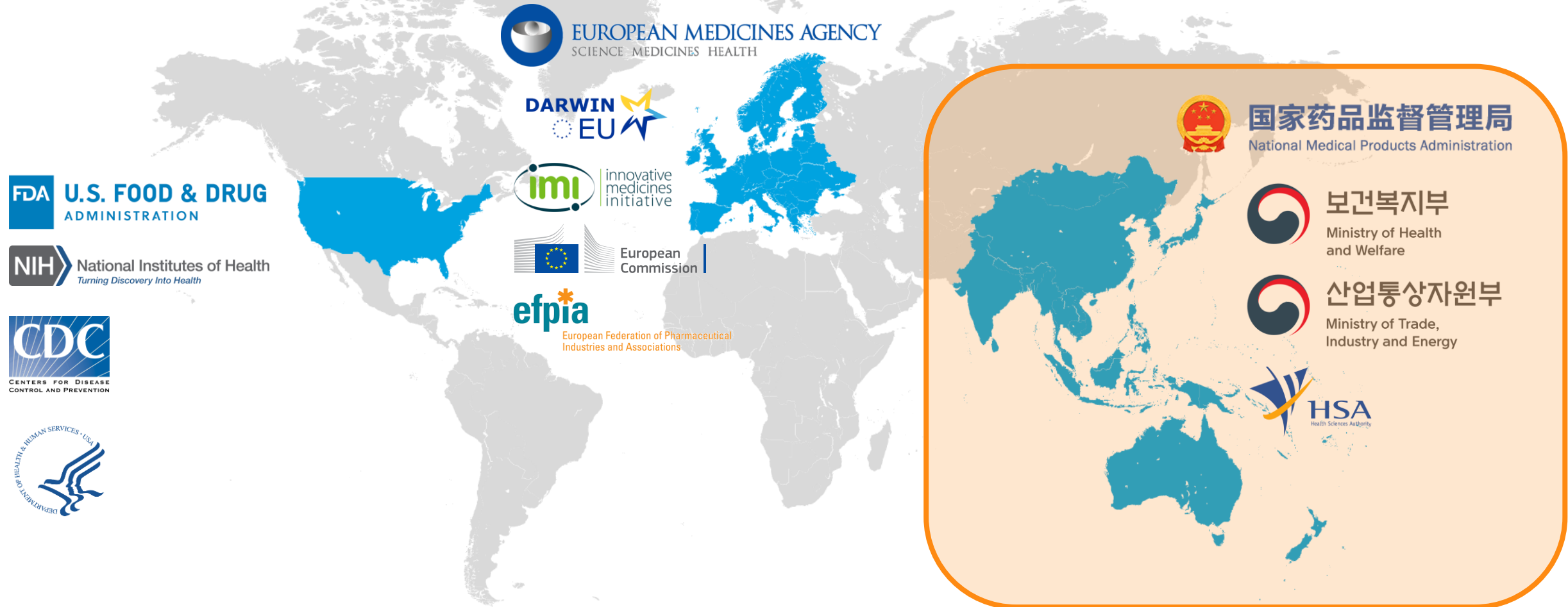
OMOP Workgroups & OHDSI Phenotype Collaborations

APAC Current Participants: 297 Lead: Mui Van Zandt	ATLAS/WebAPI Current Participants: 253 Lead: Anthony Sena	Clinical Trials Current Participants: 295 Leads: Mike Hamidi, Lin Zhen	CDM Current Participants: 686 Lead: Clair Blacketer	CDM Vocab Subgroup Current Participants: 686 Lead: Michael Kallfelz	Data Network Quality Current Participants: 298 Lead: Clair Blacketer	Dentistry Current Participants: 8 Lead: Robert Koski	Education Current Participants: 136 Lead: Nigel Hughes
HADES Current Participants: 295 Lead: Martijn Schuemie	Health Equity Current Participants: 228 Lead: Jake Gillberg	Latin America Current Participants: 48 Lead: Jose Posada	NLP Current Participants: 444 Lead: Hua Xu	Oncology Current Participants: 328 Lead: Asieh Golozar	Registry Current Participants: 175 Lead: Tina Parciak	Steering Group Current Participants: 82 Lead: Patrick Ryan	Vaccine Vocabulary Current Participants: 79 Lead: Asiyah Lin
Early-Stage Researcher Current Participants: 243 Leads: Faaziah Arshad, Ross Williams	Eye Care & Vision Research Current Participants: 74 Leads: Sally Baxter, Kerry Goetz	FHIR and OMOP Current Participants: 287 Leads: Jon Duke, Davera Gabriel, Christian Reich	GIS Current Participants: 157 Leads: Robert Miller, Kyle Zollo-Venecek, Andrew Williams	Methods Research Current Participants: 379 Leads: Martijn Schuemie, Marc Suchard	Perinatal & Reproductive Health Group Current Participants: 30 Leads: Alison Callahan et al.	Psychiatry Current Participants: 132 Leads: Dmitry Dymshyts, Andrew Williams	Surgery & Perioperative Medicine Current Participants: 42 Leads: Jenny Lane, Evan Minty
Medical Imaging Current Participants: 155 Leads: Paul Nagy, Seng Chan You	Medical Devices Current Participants: 141 Leads: Vojtech Huser, Asiyah Lin	Open-Source Community Current Participants: 145 Leads: Adam Black, Paul Nagy	Patient-Level Prediction Current Participants: 89 Leads: Jenna Reys, Ross Williams	Healthcare Systems Current Participants: 471 Lead: Melanie Philofsky	Phenotype Current Participants: 310 Lead: Gowtham Rao		

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> <u>Type 2 Diabetes Mellitus</u> | <input type="checkbox"/> <u>Parkinson's Disease and Parkinsonism</u> | <input type="checkbox"/> <u>Hidradenitis Suppurativa</u> | <input type="checkbox"/> <u>Kidney Stones</u> |
| <input type="checkbox"/> <u>Type 1 Diabetes Mellitus</u> | <input type="checkbox"/> <u>Attention Deficit Hyperactivity Disorder</u> | <input type="checkbox"/> <u>Anaphylaxis</u> | <input type="checkbox"/> <u>Delirium</u> |
| <input type="checkbox"/> <u>Atrial Fibrillation</u> | <input type="checkbox"/> <u>Hypertension</u> | <input type="checkbox"/> <u>Depression</u> | <input type="checkbox"/> <u>Systemic Lupus Erythematosus</u> |
| <input type="checkbox"/> <u>Multiple Myeloma</u> | <input type="checkbox"/> <u>Acute Myocardial Infarction</u> | <input type="checkbox"/> <u>Non-Small-Cell Lung Cancer</u> | <input type="checkbox"/> <u>Triple Negative Breast Cancer</u> |
| <input type="checkbox"/> <u>Alzheimer's Disease</u> | <input type="checkbox"/> <u>Heart Failure</u> | <input type="checkbox"/> <u>Drug-Induced Liver Injury</u> | <input type="checkbox"/> <u>Pulmonary Hypertension</u> |
| <input type="checkbox"/> <u>Hemorrhagic Events</u> | <input type="checkbox"/> <u>Cardiomyopathy</u> | <input type="checkbox"/> <u>Severe Visual Impairment And Blindness</u> | <input type="checkbox"/> <u>Prostate Cancer</u> |
| <input type="checkbox"/> <u>Neutropenia</u> | <input type="checkbox"/> <u>Multiple Sclerosis</u> | <input type="checkbox"/> <u>Suicide Attempts</u> | <input type="checkbox"/> <u>HIV</u> |



Global OHDSI Adoptions





Korean Government Initiatives

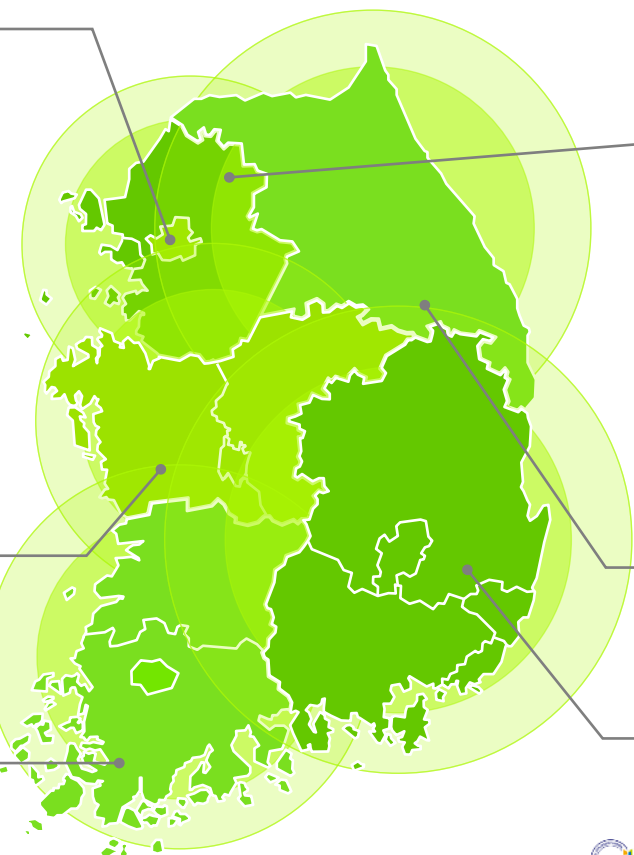
Seoul



Chungcheong



Jeolla



Incheon/Gyeonggi





Gangwon




Gyeongsang




Federated OMOP network of 62 hospitals and >76M patients 

Participation from secondary and tertiary hospitals nationwide 

Good representation of each of the provinces of South Korea 

Funded by series of grants from the Korean government 

Foster collaborative research and evidence-sharing ecosystem 



China Government's Guides on RWE & RWD

From Center for Drug Evaluation (CDE), National Medical Products Administration (NMPA)

- **1st guide** was released in Jan 2020, introducing the definition, data source requirement, design, and evaluation of using RWE for drug effectiveness study and safety monitoring.
- **2nd guide** was released in Aug 2020, focusing on the details and importance of the source, safety, curation, quality assurance and maintenance of RWD, so that reliable RWE could be produced

国家药品监督管理局药品审评中心
CENTER FOR DRUG EVALUATION, NMPA
СЕНТЕР ЛОУ ДРУГ ЕВАЛУАЦИОН, ИМБВ

此页面上的内容需要较新版本的 Adobe Flash Player.

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当前位置: 新闻中心>>工作动态>>通知公告>>新闻正文

关于公开征求《用于产生真实世界证据的真实世界数据指导原则（征求意见稿）》意见的通知

发布日期: 20200803

为进一步指导和规范申办者利用真实世界数据生成真实世界证据支持药物研发,我中心组织起草了《用于产生真实世界证据的真实世界数据指导原则（征求意见稿）》,现在中心网站予以公示,以广泛听取各界意见和建议,欢迎各界提出宝贵意见和建议,并及时反馈给我们。

征求意见时限为自发布之日起2个月。

您的反馈意见请发到以下联系人的邮箱:

联系人: 高丽丽、赵骏

联系方式: gaoll@cde.org.cn, zhaojun@cde.org.cn

感谢您的参与和大力支持。

国家药品监督管理局药品审评中心
2020年8月3日

附件 1:	《用于产生真实世界证据的真实世界数据指导原则（征求意见稿）》.docx
附件 2:	《用于产生真实世界证据的真实世界数据指导原则（征求意见稿）》起草说明.doc



China Government's Guides on RWE & RWD

CDM & OHDSI Citations in the 2nd Guide, Section 4 – Real World Data Curation

CDM Introduction in Guide:

- Under multidisciplinary collaboration, CDM was created with standardized structure, format and vocabulary, to achieve multi-center data integration and collaboration.

References in Guide:

- EMA. A Common Data Model for Europe – Why? Which? How?
<https://www.ema.europa.eu/en/events/common-data-model-europe-why-which-how>
- OHDSI – Observational Health Data Sciences and Informatics, <https://www.ohdsi.org>

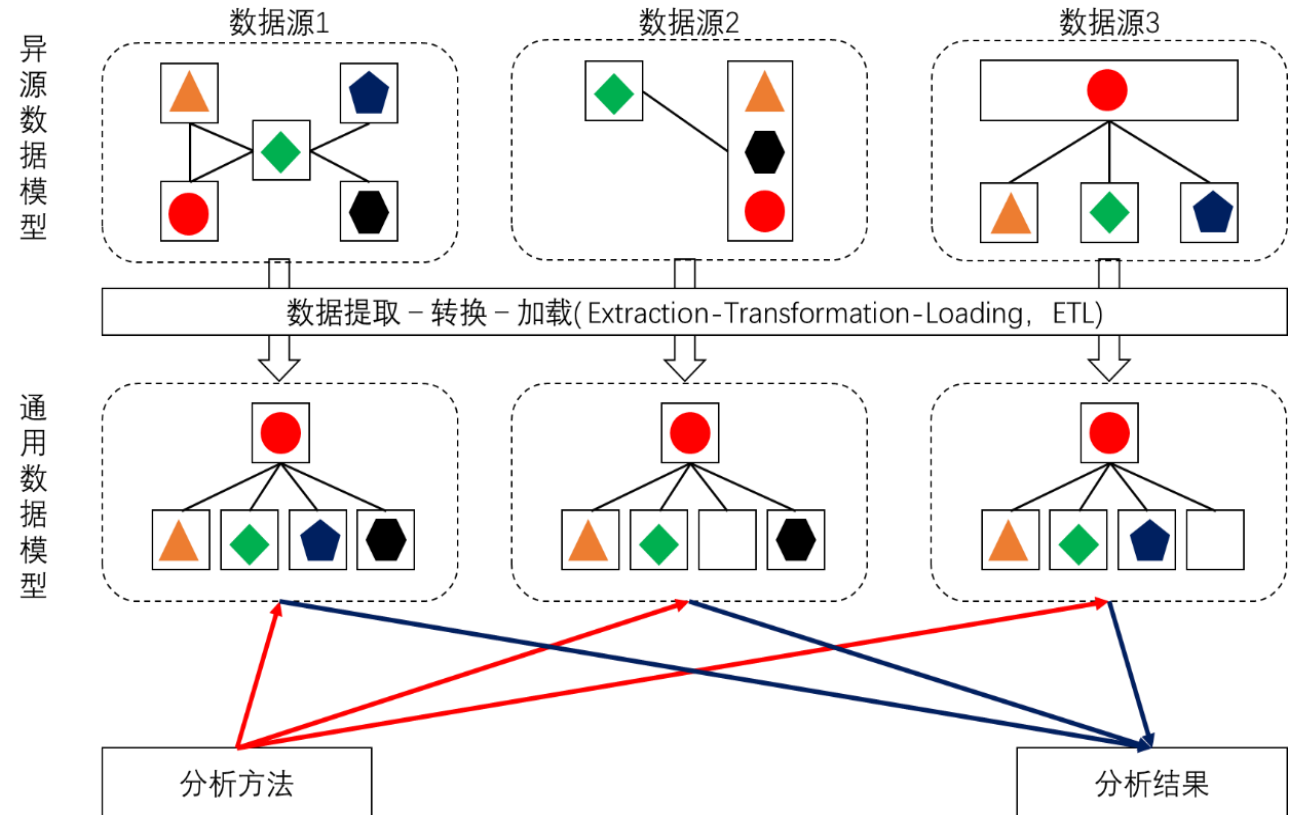


Fig. 2 in Guide – Diagram on Converting Source Data to CDM



Initiatives in Singapore



- Government building a data sharing platform using OMOP CDM (TRUST)
- OHDSI Singapore Chapter act as technical advisors

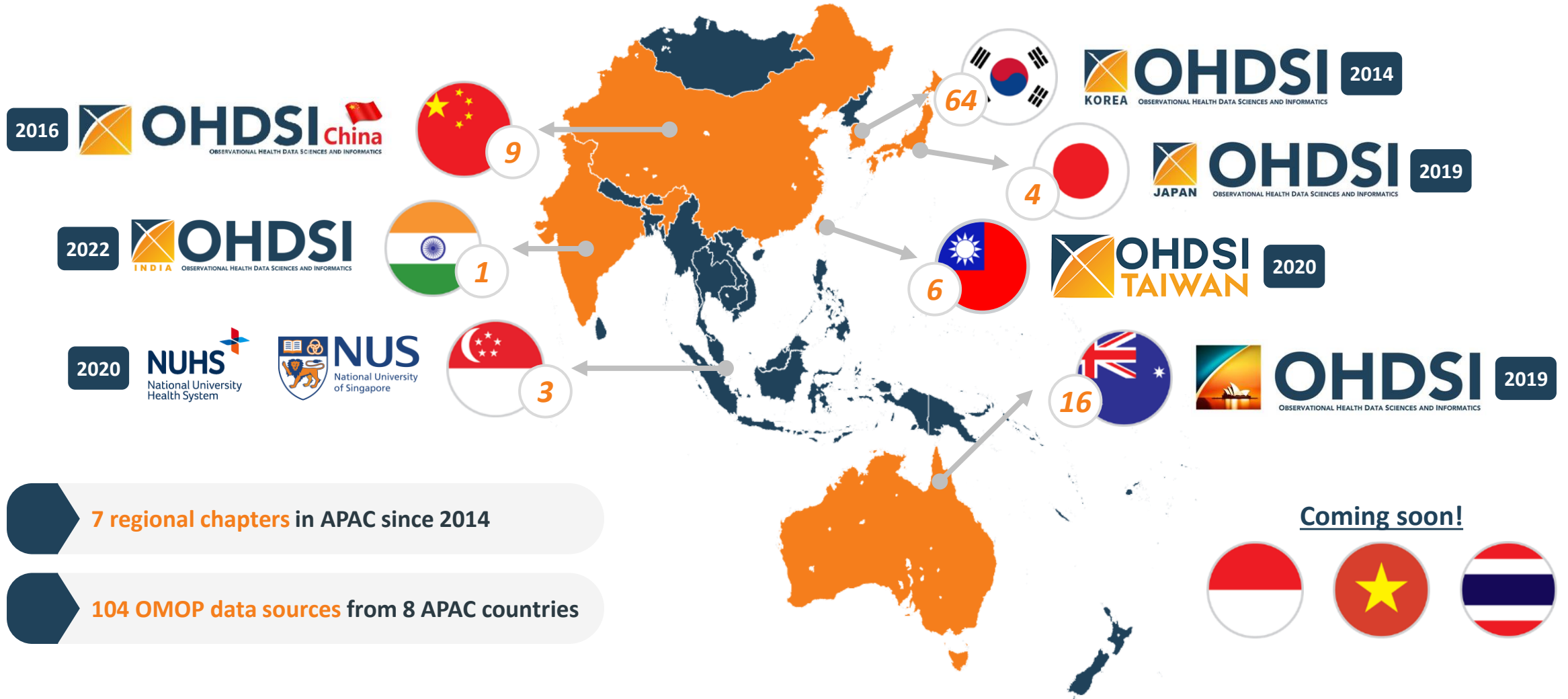
- Converted EMR data to OMOP CDM for over 300K patients between 2015 – 2018
- Participated in OHDSI APAC Hypertension study published in JAMA Network Open

- Integrate two type 2 diabetes cohorts
- First integrated research data asset for chronic disease with patients' full EMR data, social status and -omics data

OHDSI APAC Formation



Expanding APAC Collaboration



7 regional chapters in APAC since 2014

104 OMOP data sources from 8 APAC countries

1st In-person APAC Symposium



詳情請上 OHDSI-TAIWAN 官網查詢
OHDSI-TAIWAN.COM/

2022 OHDSI APAC 亞太年會在北醫

2021台灣正式成為OHDSI亞洲第六國分部
並爭取到2022亞洲年會在台北的主辦權
讓我們一起用健康資料軟實力在世界舞台發光發熱！



2022 OHDSI亞太年會大會主席
臺北醫學大學 徐之昇副教授



2022 OHDSI APAC SYMPOSIUM | 11.12 - 13
17:00
Zheng-Pu Conference Hall
Xing-Chun Building

現正熱烈報名中!!!



Chair 2022 OHDSI APAC SYMPOSIUM



Session 1.
Envisioning of
OHDSI Global & EU

Yu-Chuan (Jack) Li
Distinguished Professor
Graduate Institute of Biomedical
Informatics, Taipei Medical University,
Taiwan

Kickoff 2022 OHDSI APAC SYMPOSIUM



Session 2.
The Challenges
of Research in
OHDSI APAC

Min-Huei Hsu
Professor & Dean
Office Data Science,
Taipei Medical University

Keynote Speaker 2022 OHDSI APAC SYMPOSIUM
Session 1. Envisioning of OHDSI Global & EU



OHDSI Global Presentation

Patrick Ryan
Vice president
Observational Health Data Analytics,
Janssen Research and Development

Speaker 2022 OHDSI APAC SYMPOSIUM
Session 3. The Implication Experiences in OHDSI Region
Panel - APAC Regional adaptation to standardization



Korea

Seng Chan You
Research Assistant Professor
Ajou University

Speaker 2022 OHDSI APAC SYMPOSIUM
Session 3. The Implication Experiences in OHDSI Region
Panel - APAC Regional adaptation to standardization



China

Hua Xu
Professor
University of Texas Health Science
Center at Houston

Speaker 2022 OHDSI APAC SYMPOSIUM
Session 3. The Implication Experiences in OHDSI Region
Panel - APAC Regional adaptation to standardization



Japan

Tatsuo Hiramatsu
Professor
International University of Health
and Welfare (IUHW), Japan

Speaker 2022 OHDSI APAC SYMPOSIUM
Session 3. The Implication Experiences in OHDSI Region
Panel - APAC Regional adaptation to standardization



Singapore

Mengling 'Mornin' Feng
Assistant Professor
OHDSI Institute for Data Science, National
University of Singapore

Speaker 2022 OHDSI APAC SYMPOSIUM
Session 3. The Implication Experiences in OHDSI Region
Panel - APAC Regional adaptation to standardization



Australia

Nicole Pratt
Deputy Director
Quality Use of Medicines and Pharmacy
Research Centre, University of South
Australia

Speaker 2022 OHDSI APAC SYMPOSIUM
Session 3. The Implication Experiences in OHDSI Region
Panel - Standardization & common data models



FHIR

Adam Choe
Chief
Smart Health Leadership
Centre, NUS

Expanding Community Outreach

2023 APAC Symposium

- ✓ 2-day in-person event hosted in Sydney, Australia
- ✓ 110 attendees from around the world represented by all stakeholder groups including consumer!



July



December

2023

2023 OHDSI CHINA 年会

2023 OHDSI China Annual Symposium

12月15日-12月18日
December 15-18 2023

复旦大学枫林校区
Fudan University, Fenglin Campus

OHDSI (THE OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS) 是一个世界性的公益型研究联盟, 旨在推动全方位医学大数据分析的开源解决方案, 通过大规模数据分析和挖掘来提升临床医学数据价值, 实现跨学科、跨行业的多方合作。大会将邀请国内外顶尖专家学者, 与同行们共同分享国内及国际OHDSI使用心得、建设方法、临床信息、大数据、人工智能、医学信息等前沿领域成果, 促进多学科交叉合作。OHDSI CHINA作为OHDSI中国分支, 力图促进国内健康医疗数据治理和挖掘能力的提升, 与国际接轨, 推动我国健康医疗大数据的发展。OHDSI中国分部计划联合复旦大学智能医学研究院举办一年一度的OHDSI CHINA年会。

OHDSI培训班将于2023年12月16日举办,旨在培养关于OHDSI/OMOP的方法论, 和工具的应用。培训内容包括: 讲解OMOP通用数据模型CDM和标准术语集, 展示分析工具ATLAS的应用, 和OMOP研究发表的案例分享。凡注册本年会的人员即可免费参加OHDSI培训班, 由于培训地点空间受限, 培训班名额有限, 先注册先得! 后续报名成功后会收到短信或邮件推送, 告知具体地点及相关课程安排。

2023 OHDSI CHINA 年会在复旦大学枫林校区明道楼一楼报告厅隆重举行, 会议具体议程如下:



2023 China Symposium

- ✓ 4-day in-person event hosted in Shanghai, China consisting of main conference and tutorials
- ✓ China regional experts from all disciplinary areas

Expanding Community Outreach

April APAC

- ✓ Two in-person events hosted in Japan and Thailand
- ✓ Targeted to familiarize new collaborators in the region with OHDSI/OMOP and understand local perspectives/considerations

OMOP CDMを活用したリアルワールドデータ活用推進に向けて OHDSI one-day event in Tokyo, Japan

要申込
定員60名

2024年4月17日(水) 13:00～15:00

Hands-on sessionは15:30～19:30 定員15名
参加ご希望の方は登録フォームの参加希望欄にチェックをつけてください

お申込みは
こちらから



<https://odjpn.doorkeeper.jp/events/171041>

会場：国立がん研究センター セミナールームA
〒104-0045 東京都中央区築地5-1-1

定員の都合により、お申込みいただいてもご参加いただけない場合がございます。

Transforming Evidence Generation in Thailand with OHDSI/OMOP: An Introductory Tutorial

Hosted by IQVIA and Siriraj Informatics and Data Innovation Center (SiData+)

IQVIA and SiData+ brings together medical and healthcare professionals in Thailand to familiarize with the process of transforming data into evidence using the OMOP Common Data Model, OHDSI tools, and scientific best practices.

- Learn about global Real World Data/ Real World Evidence trends, especially in the Asia Pacific region
- Conduct hands-on experiences for deeper understanding of vocabulary mapping and Extract-Transform-Load (ETL)
- Gain understanding of OHDSI/OMOP and its impact on medical research in Thailand
- Network with like-minded fellow clinicians, researchers and developers in Thailand

Wednesday, 24 April 2024 | Eastin Grand Hotel Phayathai, Bangkok, Thailand



April

December



2024



2024 APAC Symposium

- ✓ 4-day in-person event hosted in Singapore consisting of lectures, tutorials and a datathon
- ✓ Co-hosted with Singapore Healthcare AI Datathon & Expo (SHADE) 2024



APAC Studies

JAMA Network Open

Original Investigation | Pharmacy and Clinical Pharmacology

Ranitidine Use and Incident Cancer in a Multinational Cohort

Seng Chan You, MD; Seung In Seo, MD; Thomas Falconer, MSc; Chen Yanover, PhD; Talita Duarte-Salles, PhD; Sarah Seager, BA; Jose D. Posada, PhD; Nigam H. Shah, PhD; Phung-Anh Nguyen, PhD; Yeeseuk Kim, MD; Jason C. Hsu, PhD; Mui Van Zandt, BS; Min-Huei Hsu, MD; Hang Lak Lee, MD; Heejoon Ko, MD; Woon Geon Shin, MD; Nicole Pratt, PhD; Rae Woong Park, MD; Christin G. Reich, MD; Marc A. Suchard, MD; George Hripcsak, MD; Chan Hyuk Park, MD; Daniel Prieto-Alhambra, MD

Abstract

IMPORTANCE Ranitidine, the most widely used histamine-2 receptor antagonist (H₂RA), was withdrawn because of N-nitrosodimethylamine impurity in 2020. Given the worldwide exposure to this drug, the potential risk of cancer development associated with this drug is an important epidemiological concern.

OBJECTIVE To examine the comparative risk of cancer associated with H₂RAs.

Key Points

Question Is use of ranitidine associated with higher risk for incident cancer

Research

JAMA Psychiatry | Original Investigation

Rates of Antipsychotic Drug Prescribing Among People Living With Dementia During the COVID-19 Pandemic

Hao Luo, PhD; Wallis C. Y. Lau, PhD; Yi Chai, PhD; Carmen Olga Torre, MSc; Robert Howard, MD; Kathy Y. Liu, PhD; Xiaoyu Lin, MSc; Can Yin, MSc; Stephen Fortin, PharmD; David M. Kern, PhD; Dong Yun Lee, MD; Rae Woong Park, PhD; Jae-Won Jang, MD; Celine S. L. Chui, PhD; Jing Li, MSc; Christian Reich, PhD; Kenneth K. C. Man, PhD; Ian C. K. Wong, PhD

IMPORTANCE Concerns have been raised that the use of antipsychotic medication

Editorial page 199
Supplemental content

Total 41 publications from APAC in 2023, including 2 multi-center publications in JAMA, and 14 publications so far in 2024

PLOS ONE **JAMA Network Open** **JAMA Psychiatry** **Scientific Data** **Pharmaceuticals** **JHEP Reports**

Journal of Hypertension **Journal of Medical Internet Research** **Thrombosis Journal** **Nutrients**

Scientific Reports **Journal of Clinical Medicine**



Save Our Sisyphus (SOS) Challenge

35 Research Questions

Submitted by the OHDSI community

4 Studies

Selected to be designed, implemented, executed and disseminated by the community as a whole

1 Study Led by APAC

Is fluoroquinolone use really associated with the development of aortic aneurysms? led by Korea and Australia

9 Weekly Tutorials

Taught by global subject matter experts in two time zones to accommodate the entire global community

5 Months

From study conception to fruition, enabling presentation of preliminary study results at the APAC Symposium

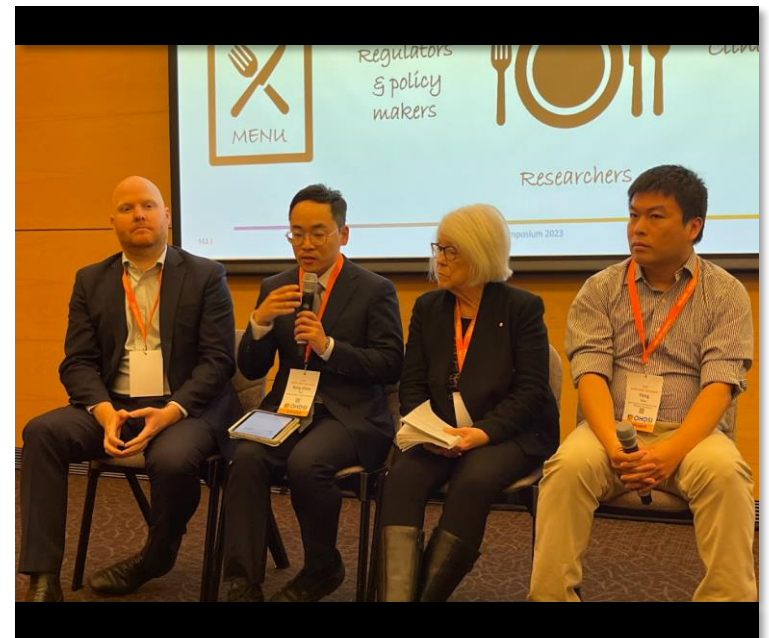
OHDSI SOS Challenge 2023

Study overview: Is fluoroquinolone use associated with the development of aortic aneurysms and aortic dissections?

Chief investigators:
Seng Chan You, Seonji Kim, Jung Ho Kim, Jung Ah Lee - Yonsei University
Jack Janetzki, Nicole Pratt - University of South Australia

1 Important Lesson

Panel discussion with regulator, clinician, researcher, and consumer representatives triggered a critical debate on how we as a research community should best convey our findings to the general public





LEGEND: Large-scale Evidence Generation and Evaluation across a Network of Databases

GOAL: To generate real world evidence on the effects of medical interventions using observational healthcare data to support clinical decision making

IMPACT: LEGEND has produced a new model for generating reliable evidence and new opportunities for collaborative research



JAMA Internal Medicine | Original Investigation

Comparison of Cardiovascular and Safety Outcomes of Chlorthalidone vs Hydrochlorothiazide to Treat Hypertension

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Original Investigation | Cardiology

Analysis of Dual Combination Therapies Used in Treatment of Hypertension in a Multinational Cohort

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ARTICLES | ONLINE FIRST

Comprehensive comparative effectiveness and safety of first-line antihypertensive drug classes: a systematic, multinational, large-scale analysis

Prof Marc A Suchard, MD, PhD; Martijn J Schuemie, PhD; Prof Harlan M Krumholz, MD; Seng Chan You, MD; RuiJun Chen, MD; Nicole Pratt, PhD; Christian G Reich, MD; Jon Duke, MD; Prof David Madigan, PhD; Prof George Hripcsak, MD; Patrick B Ryan, PhD; Show less

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Hypertension

Volume 78, Issue 3, September 2021; Pages 591-603
<https://doi.org/10.1161/HYPERTENSIONAHA.120.16667>

ANTIHYPERTENSIVE TREATMENT

Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers: A Multinational Cohort Study

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

Open access Protocol

BMJ Open 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

Rohan Khara, Martijn J Schuemie, Yuan Lu, Anna Ostroplets, RuiJun Chen, George Hripcsak, Patrick B Ryan, Harlan M Krumholz, Marc A Suchard



Analysis of Dual Combination Therapies Used in Treatment of Hypertension in a Multinational Cohort

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Original Investigation | Cardiology

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Abstract

IMPORTANCE More than 1 billion adults have hypertension globally, of whom 70% cannot achieve their hypertension control goal with monotherapy alone. Data are lacking on clinical use patterns of dual combination therapies prescribed to patients who escalate from monotherapy.

OBJECTIVE To investigate the most common dual combinations prescribed for treatment escalation in different countries and how treatment use varies by age, sex, and history of cardiovascular disease.

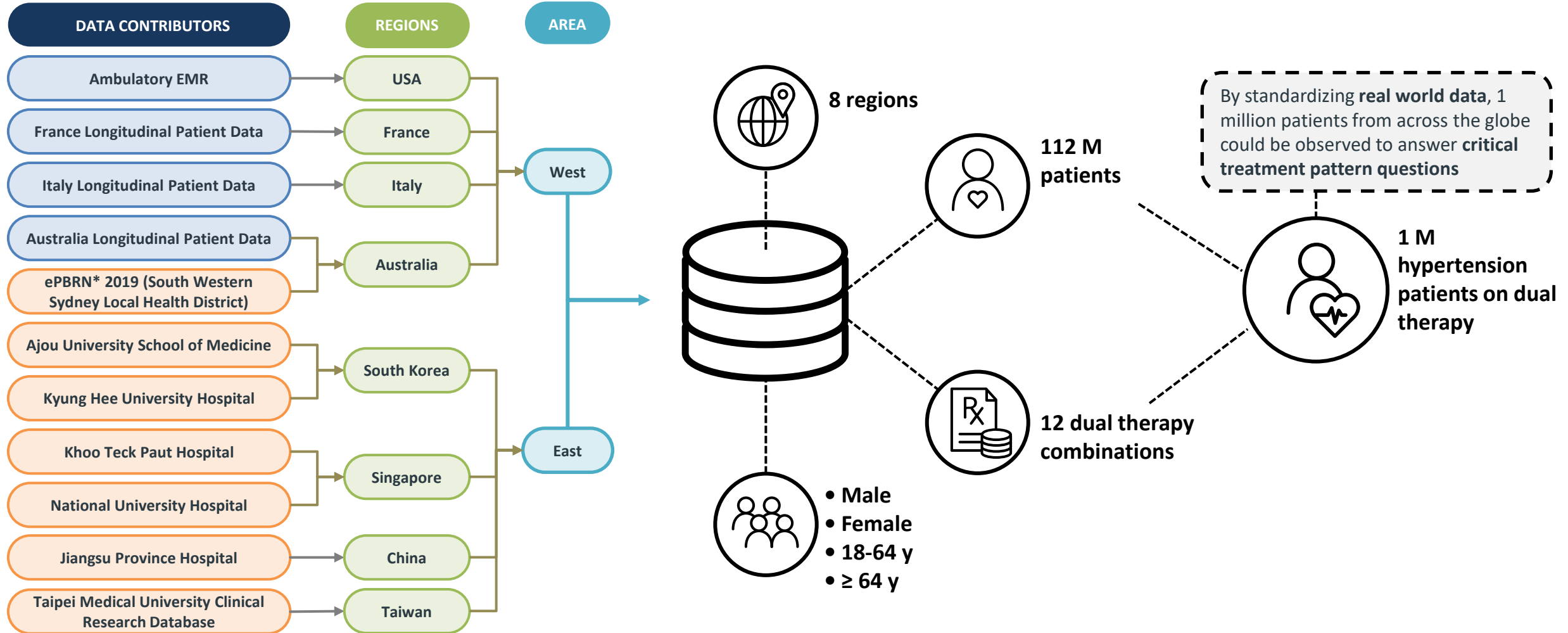
Key Points

Question What are the most common antihypertensive dual combinations prescribed to patients who escalate from monotherapy in clinical practice, and how do the combinations differ by country and patient demographic subgroup?



Hypertension: Dual Combination Therapy Patterns

11 electronic health record databases (4 from IQVIA, 7 from external contributors) were combined using the Observational Medical Outcomes Partnership (OMOP) standard data model





Hypertension: Dual Combination Therapy Patterns

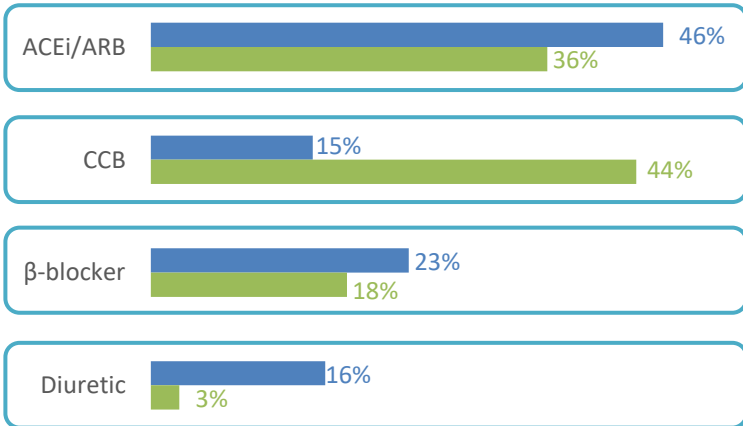


Clinical Findings

- Significant variations in antihypertensive prescribing patterns were observed between East and West regions
 - Both the **initial** antihypertensive treatment and **preference for dual therapy combinations** varied between regions
 - Despite real world evidence supporting CCBs having superior outcomes², they are the **least popular** treatment worldwide
 - Variations were observed down to the patient subgroup level (age, gender), allowing for deeper insights

Starting Therapy (% of Patients)

West East



West: United States, France, Italy, Australia
East: South Korea, Singapore, China, Taiwan

Dual Therapy Combinations	West	East
ACEi/ARB	46%	36%
→ CCB	31%	76%
→ β-blocker	31%	17%
→ Diuretic	38%	7%
CCB	15%	44%
→ ACEi/ARB	56%	74%
→ β-blocker	27%	23%
→ Diuretic	17%	3%
β-blocker	23%	18%
→ ACEi/ARB	57%	45%
→ CCB	23%	53%
→ Diuretic	20%	2%
Diuretic	16%	3%
→ ACEi/ARB	63%	45%
→ CCB	17%	46%
→ β-blocker	20%	9%



Real World Implications

By using **real world data**, prescribing patterns and patient outcomes can be observed and the underlying reasons explored:

- Adherence to prescribing guidelines
- Cost
- Patient outcomes
- Responsiveness to research



Methodology

Computer Methods and Programs in Biomedicine 211 (2021) 106394

International Journal of Medical Informatics 163 (2022) 104762



Contents lists available at [ScienceDirect](#)

Computer Methods and Programs in Biomedicine

journal homepage: www.elsevier.com/locate/cmpb



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International Journal of Medical Informatics

journal homepage: www.elsevier.com/locate/ijmedinf



A standardized analytics pipeline for reliable and rapid development and validation of prediction models using observational health data



Reps et al.
BMC Medical Informatics and Decision Making (2022) 22:142
<https://doi.org/10.1186/s12911-022-01879-6>

BMC Medical Informatics and Decision Making

Open access

Original research

BMJ Open Investigating the impact of development and internal validation design when training prognostic models using a retrospective cohort in big US observational healthcare data

Jenna M Reps ^{1,2}, Patrick Ryan, ^{1,2} P R Rijnbeek ^{1,3}

Evaluating the impact of covariate feedback times on performance of patient-level prediction models



Jill Hardin ^{1,2*} and Jenna M. Reps ^{1,2}

RESEARCH

Open Access

Learning patient-level prediction models across multiple healthcare databases: evaluation of ensembles for increasing model transportability



Jenna Marie Reps ^{1†}, Ross D. Williams ^{2†}, Martijn J. Schuemie ¹, Patrick B. Ryan ¹ and Peter R. Rijnbeek ²

with patients who are lost to follow-up when developing prognostic models using a cohort design

Jenna M. Reps ^{1*} , Peter Rijnbeek ², Alana Cuthbert ³, Patrick B. Ryan ¹, Nicole Pratt ⁴ and Martijn Schuemie ¹



Summary

1

Open Source

CDM, tools, methods, and documentation all publicly available

2

Standardization

Standard CDM, vocabulary/ontology, tools, methods, data quality, and documentation

3

Research Community

Large research community with multiple stakeholders and disciplines

4

Multi-country/multi-center research

Large scale research using standardized tools and methods



Join The Journey

As a community, we are collaborating towards improving health outcomes for patients around the world.

To achieve this goal, we are developing [open-source analytic tools](#) and generating high-quality evidence to inform medical decision making.

Whether you're a software developer, physician or clinical researcher, there is a place for everyone in the OHDSI community.

Want to Join The Journey? Here are a few ways you can get started!



<https://www.ohdsi.org/join-the-journey/>



Thank you!

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