OHDSI APAC Symposium
Welcome to the Journey!

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OHDSI is

an open science community

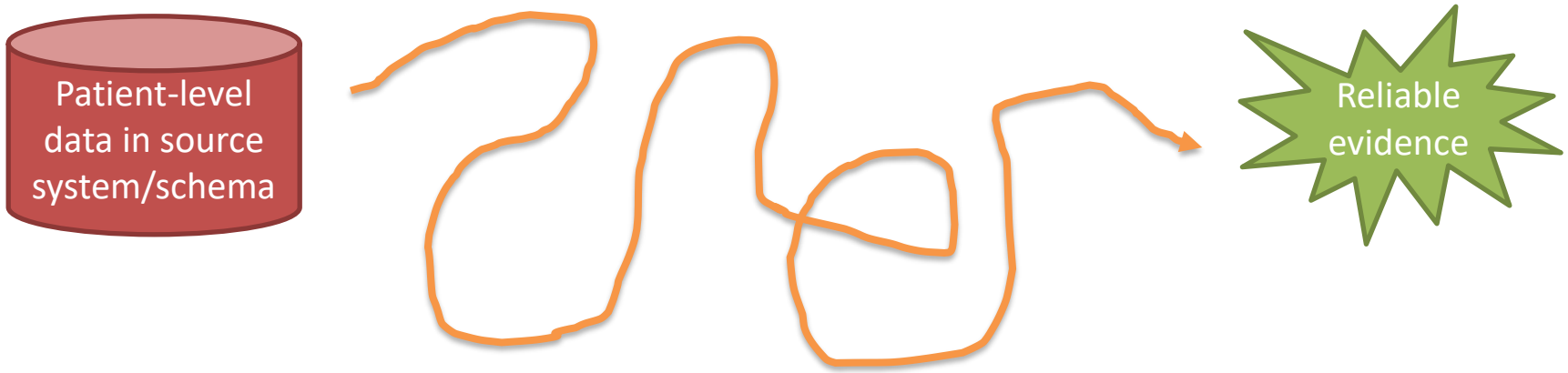
OHDSI's mission

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

OHDSI's values

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

The journey to real-world evidence



Desired attributes for reliable evidence

Desired attribute	Question	Researcher	Data	Analysis		Result
Repeatable	Identical	Identical	Identical	Identical	=	Identical
Reproducible	Identical	Different	Identical	Identical	=	Identical
Replicable	Identical	Same or different	Similar	Identical	=	Similar
Generalizable	Identical	Same or different	Different	Identical	=	Similar
Robust	Identical	Same or different	Same or different	Different	=	Similar
Calibrated	Similar (controls)	Identical	Identical	Identical	=	Statistically consistent

Why reliable evidence requires a community effort

Desired attribute	Question	Researcher	Data	Analysis		Result
	Identical	Identical	Identical	Identical	=	Identical
	Identical	Different	Identical			Identical
	Identical	Same or	Similar			Similar
Generalizable	Ide		Different	Identical	=	Similar
Robust	Ide	Same or different		Different	=	Similar
Calibrated	Similar (controls)	Iden		Identical	=	

Community of researchers with important public health questions

Data network using community standards

Analyses sharing community open-source tools

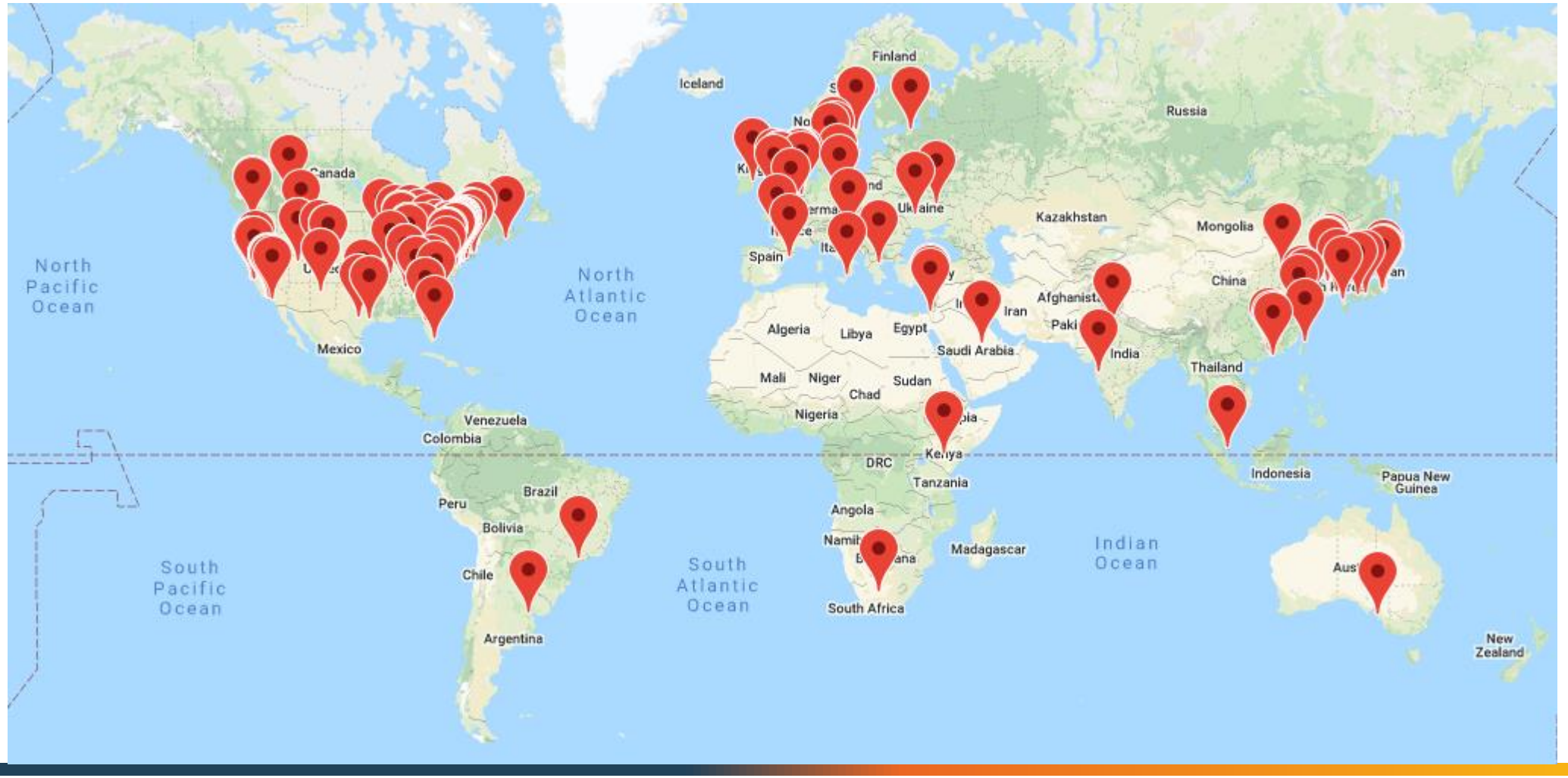
Application of community best practices for evaluation

Evidence sharing across community

OHDSI is
an international data network

OHDSI community

We're all in this journey together…



OHDSI's community engagement

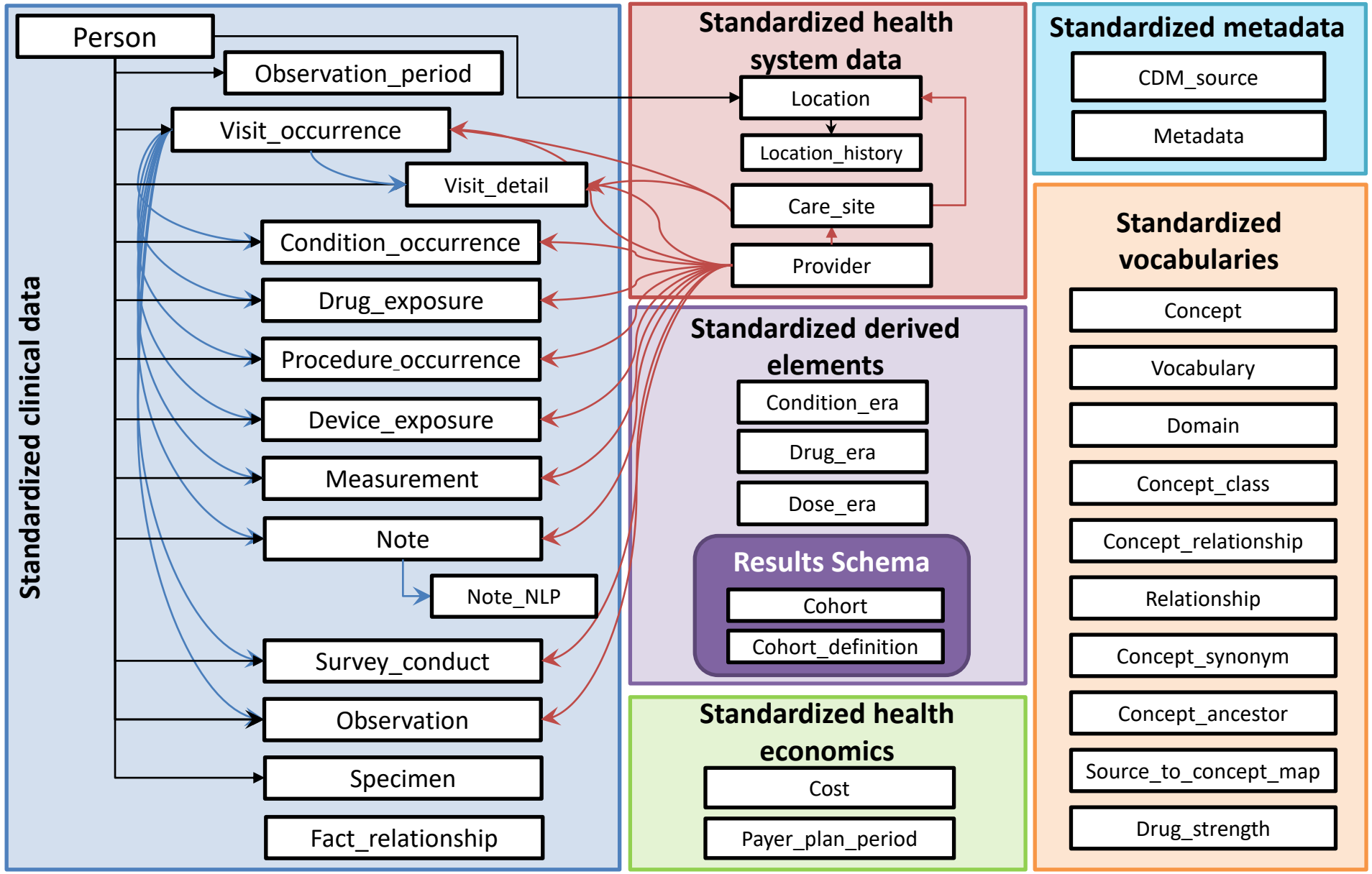
- Active community online discussion: forums.ohdsi.org
  - **3,997** distinct users have made **25,117** posts with **4,705,098** pageviews
  - Implementers, Developers, Researchers, CDM Builders, Vocabulary users, OHDSI in Korea, OHDSI in China, OHDSI in Europe
- Weekly community meetings for all collaborators to share their research ideas and progress
- 10 workgroups for solving shared problems of interest
- 5 regional chapters fostering local collaborations: Korea, Japan, China, Europe, Australia
- Tutorials in OHDSI tools and best practices, taught by OHDSI collaborators for OHDSI collaborators, 'live' and through EHDEN Academy
- OHDSI Symposiums held annually in North America, Europe and Asia to provide the community 'face-to-face' opportunities to showcase research collaborations
- Follow us on Twitter @OHDSI and LinkedIn
- ***New:*** OHDSI Microsoft Teams environment created to further enable collaboration

Data across the OHDSI community

- 205 self-reported entries on 2020 OHDSI Data Network inventory
- **166** different databases with patient-level data from various perspectives:
  - Electronic health records, administrative claims, hospital systems, clinical registries, health surveys, biobanks
- **23** different countries with at least one database in the community
- **>578 million** distinct patients (as determined by max per country)
  - >250m in US, >100m in Europe, >100m in South America, >50m in Asia
- **>2.7 billion** patient records across all databases who reported to be part of the network

All using one open community data standard:
OMOP Common Data Model

Open community data standard: OMOP CDM



OHDSI's standardized vocabularies

- 153 Vocabularies across 41 domains
  - MU3 standards: SNOMED, RxNorm, LOINC
  - Disparate sources: ICD9CM, ICD10(CM), Read, NDC, Gemscript, CPT4, HCPCS…
- >9 million concepts
  - >3.3 million standard concepts
  - >5.1 million source codes
  - >629,000 classification concepts
- >55 million concept relationships
- >84 million ancestral relationships

Vocabularies Mapped to OMOP Standards: APAC

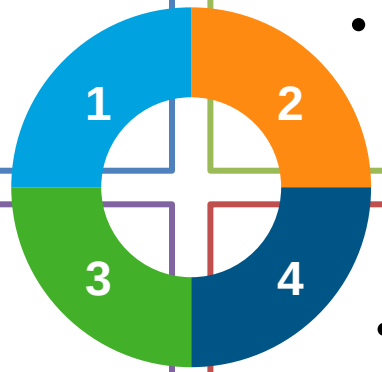
Condition, Procedure, Drug, Measurement

Condition

- Source Vocabulary
  - ICD10CN (34,491), mapped to standard 98.5%
  - KCD7 (22,508), mapped to standard 71%
- Standard Vocabulary – SNOMED

Procedure

- Source Vocabulary
  - ICD9ProcCN (13,385), mapped to standard 99.9%
- Standard Vocabulary – SNOMED, ICD9Proc, CPT4, HCPCS



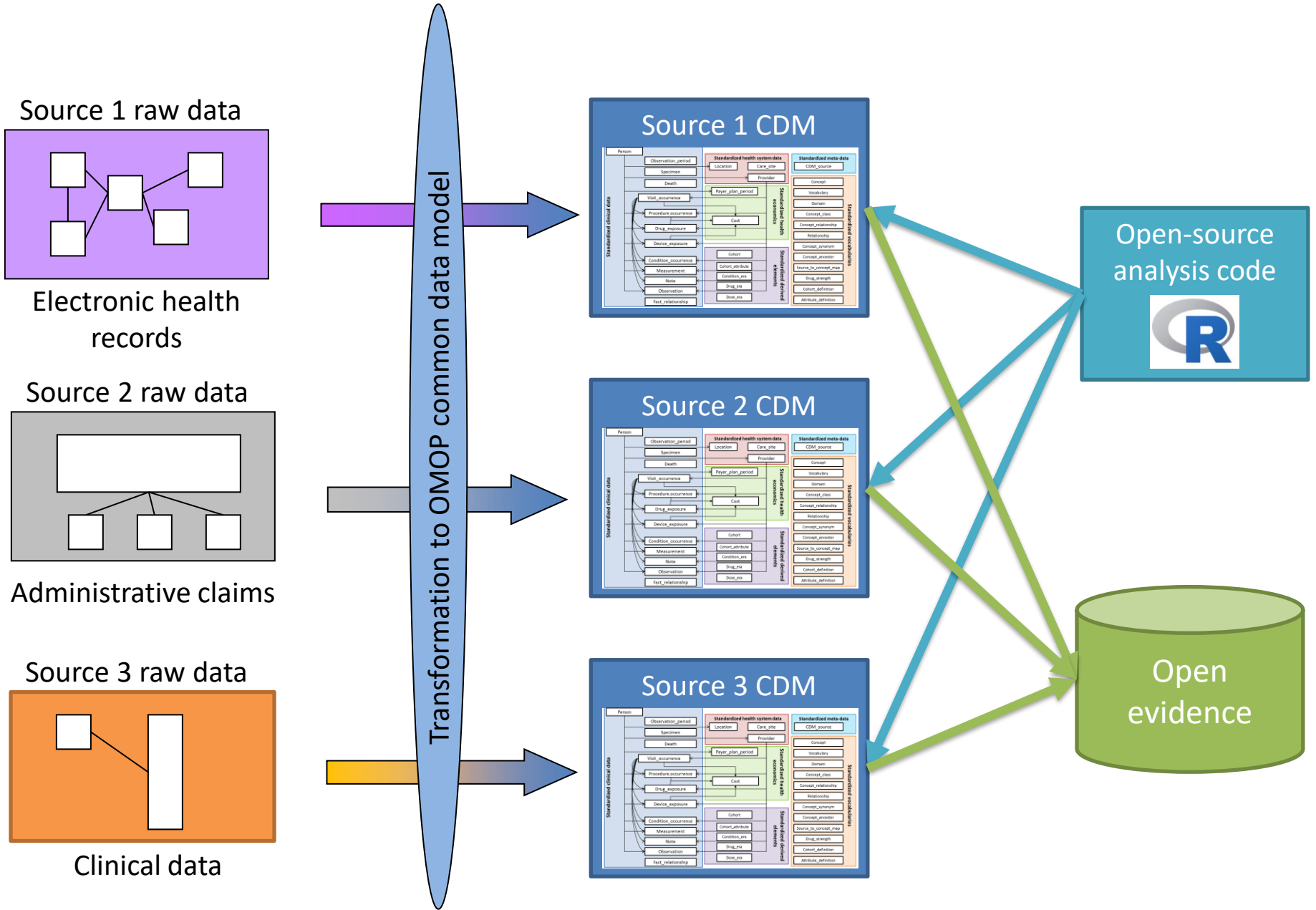
Drug

- Source Vocabulary
  - China NCCD (51,309), mapped to standard 91%
  - Korea EDI (313,431), mapped to standard 0.51%
  - Japan JMDC (35,962), mapped to standard 82%
- Standard Vocabulary – RxNorm, RxNorm Ext

Measurement

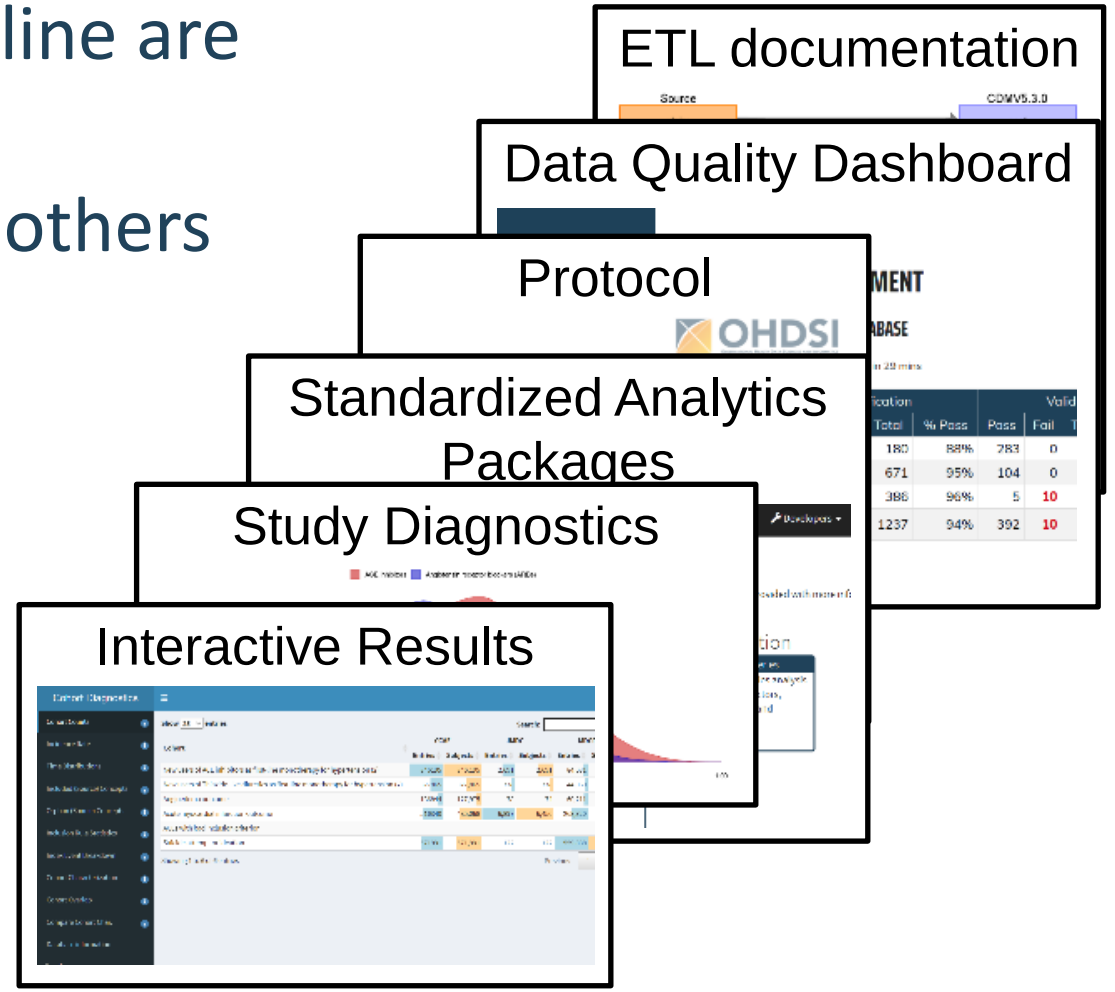
- Source Vocabulary
  - LOINC-CN
- Added synonyms in Chinese
- Standard Vocabulary – LOINC

Common data model to enable standardized analytics



Driving agenda of full transparency

- All artifacts of our analytics pipeline are made available to the public
- In doing so, we are encouraging others to do the same
- Transparency is key to
  - Reproducibility
  - Interpretability
  - Trustworthiness



OHDSI
generates evidence

OHDSI: an open science community

Mission:

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

OHDSI COVID-19 Study-a-Thon (3/2020)

Snapshot of the OHDSI COVID-19 Data Network

USA (11)	EUROPE (8)	ASIA-PACIFIC (3)
Columbia University (NY – EHR)	CPRD (UK – EHR)	HIRA (South Korea – Administrative Claims)
Department of Veterans Affairs (National – EHR)	DA Germany (Germany – EHR)	DCMC (South Korea – EHR)
HealthVerity (Claims linked to diagnostic testing)	HM Hospitales (Spain – Hospital Billing)	Nanfang Hospital (China – EMR)
IQVIA Open Claims (National – Administrative Claims)	IPCI (Netherlands – EHR)	
Optum EHR (National – EHR)	LPD France (France – EHR)	
Optum SES (National – administrative claims)	LPD Italy (Italy – EHR)	
Premier (National – Hospital Billing)	SIDIAP (Spain – EHR)	
Stanford University (CA – EHR)	SIDIAP-H (Spain – EHR Hospital linkage)	
Tufts University (MA – EHR)		
University of Colorado Anschutz Medical Campus (CO – EHR)		
University of Washington Medicine COVID Research Dataset (WA – EHR)		

Together, OHDSI has studied:

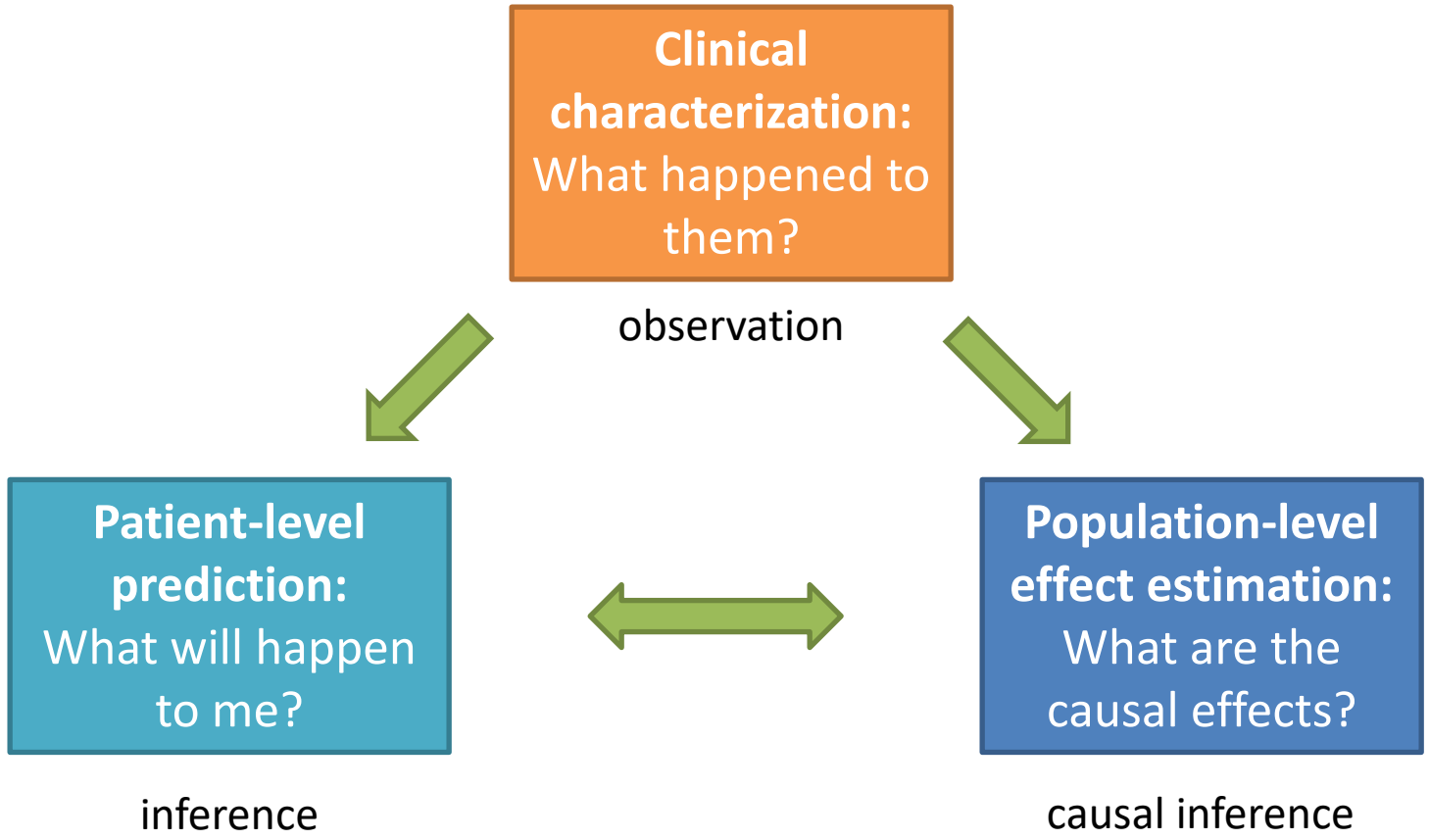
- **>7.4m** patients tested for SAR-COV-2
- **>1.6m** patients diagnosed or tested positive for COVID-19
- **>300k** patients hospitalized with COVID-19

#OHDSICOVID19

EHR = Electronic Health Records, EMR = Electronic Medical Records

As of 12Oct2020

Complementary evidence to inform the patient journey



Characterization

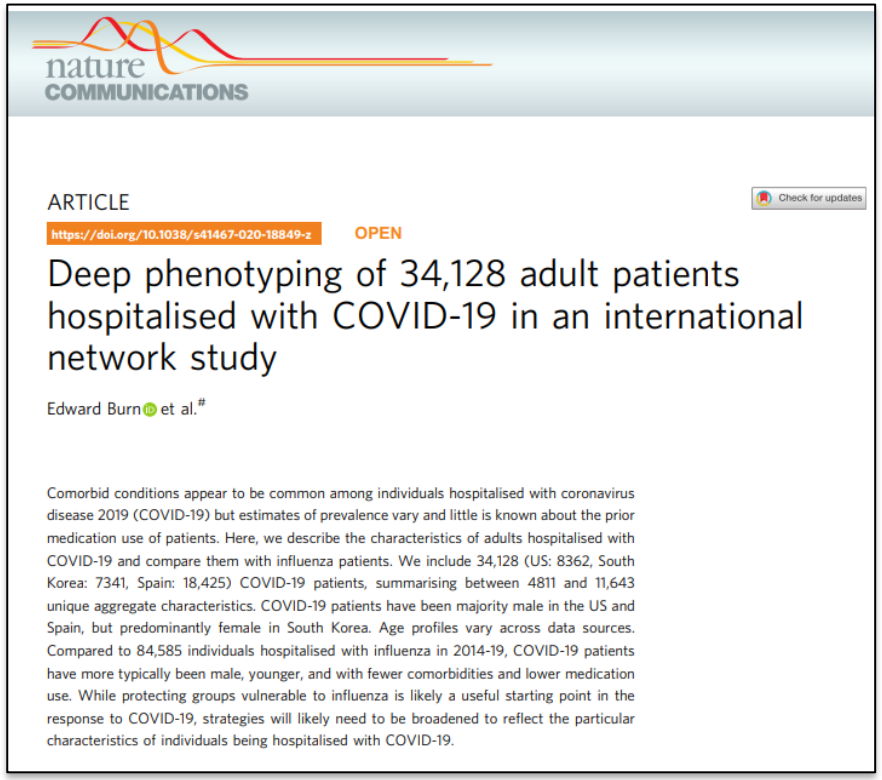
Disease Natural History of COVID-19

- Describe baseline characteristics for those hospitalized for COVID-19 as compared to those hospitalized for influenza

Findings:

- Patients hospitalized with COVID are systematically different from those hospitalized with flu
- COVID hospitalized patients, when compared those hospitalized for influenza:
  - Greater proportion are male and slightly younger
  - Fewer comorbidities and lower medication use

- Utilized claims and electronic medical records from 10 databases across 3 different countries



nature COMMUNICATIONS

ARTICLE

Check for updates

https://doi.org/10.1038/s41467-020-18849-z OPEN

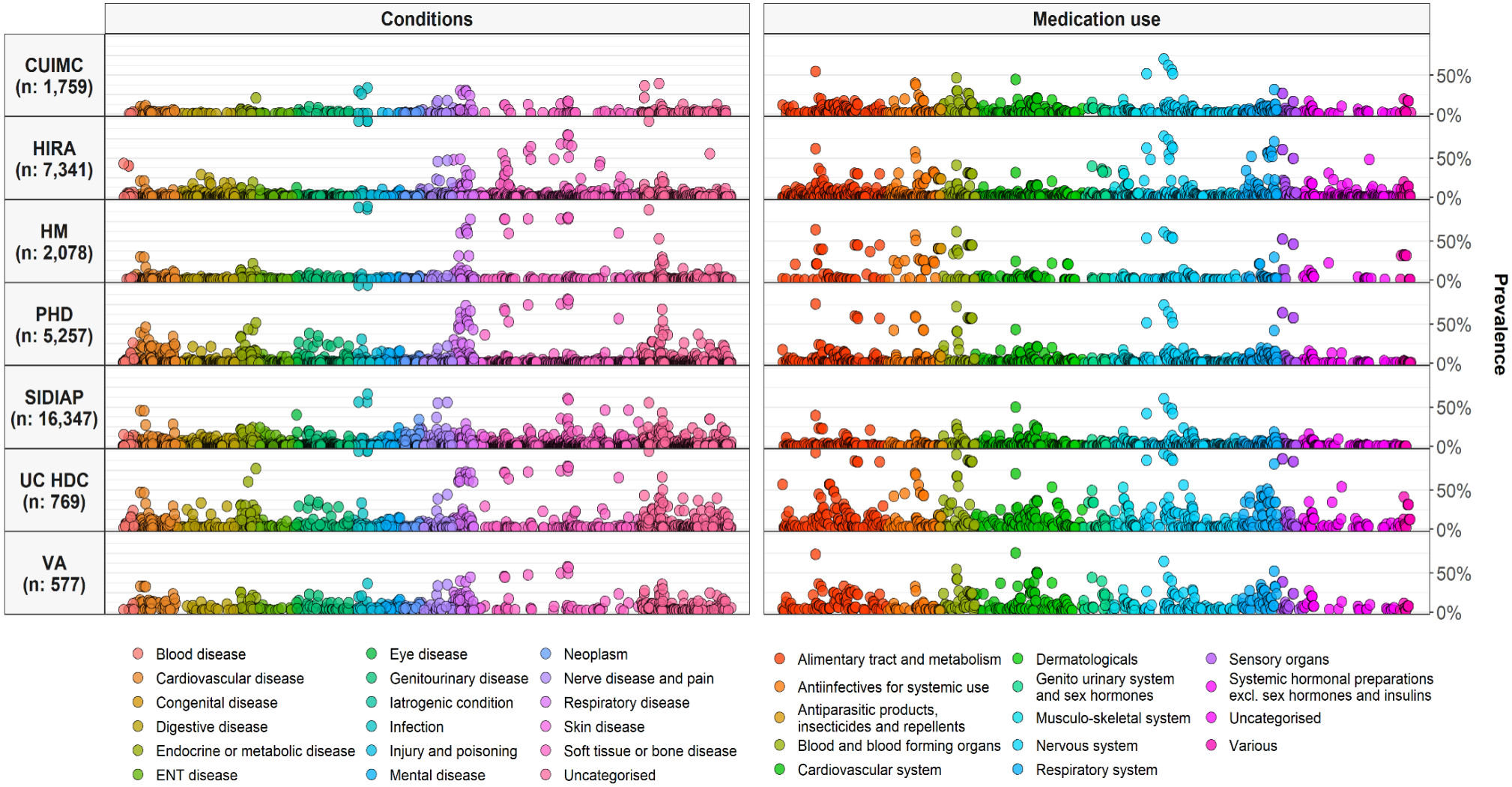
Deep phenotyping of 34,128 adult patients hospitalised with COVID-19 in an international network study

Edward Burn et al.#

Comorbid conditions appear to be common among individuals hospitalised with coronavirus disease 2019 (COVID-19) but estimates of prevalence vary and little is known about the prior medication use of patients. Here, we describe the characteristics of adults hospitalised with COVID-19 and compare them with influenza patients. We include 34,128 (US: 8362, South Korea: 7341, Spain: 18,425) COVID-19 patients, summarising between 4811 and 11,643 unique aggregate characteristics. COVID-19 patients have been majority male in the US and Spain, but predominantly female in South Korea. Age profiles vary across data sources. Compared to 84,585 individuals hospitalised with influenza in 2014-19, COVID-19 patients have more typically been male, younger, and with fewer comorbidities and lower medication use. While protecting groups vulnerable to influenza is likely a useful starting point in the response to COVID-19, strategies will likely need to be broadened to reflect the particular characteristics of individuals being hospitalised with COVID-19.

Characterization

Disease Natural History of COVID-19

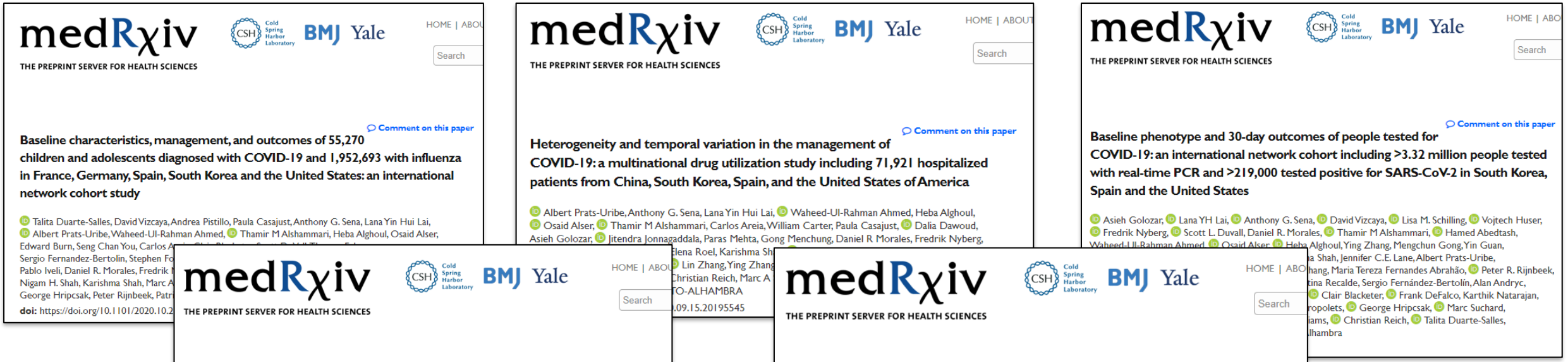


Characterization

CHARYBDIS Results Viewer

Interactive application for exploring disease natural history:

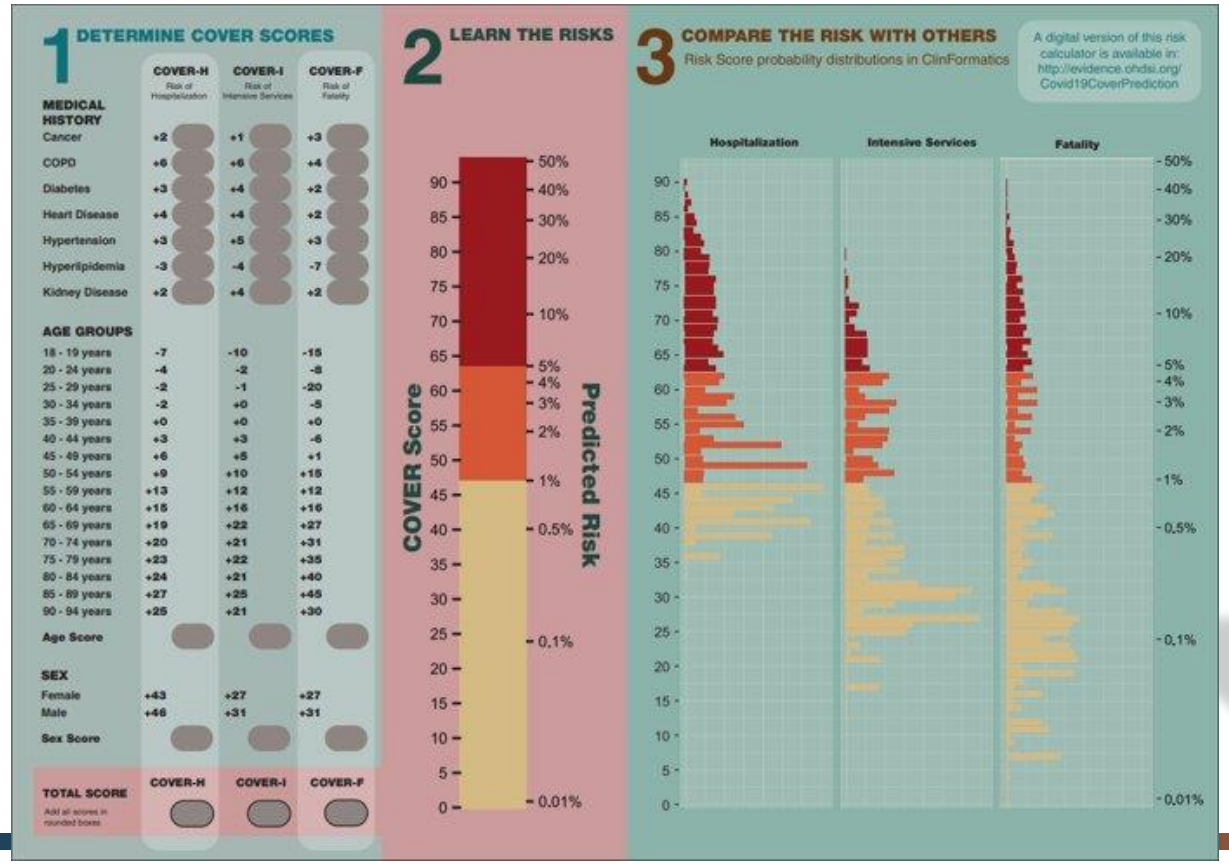
- https://data.ohdsi.org/Covid19CharacterizationCharybdis/

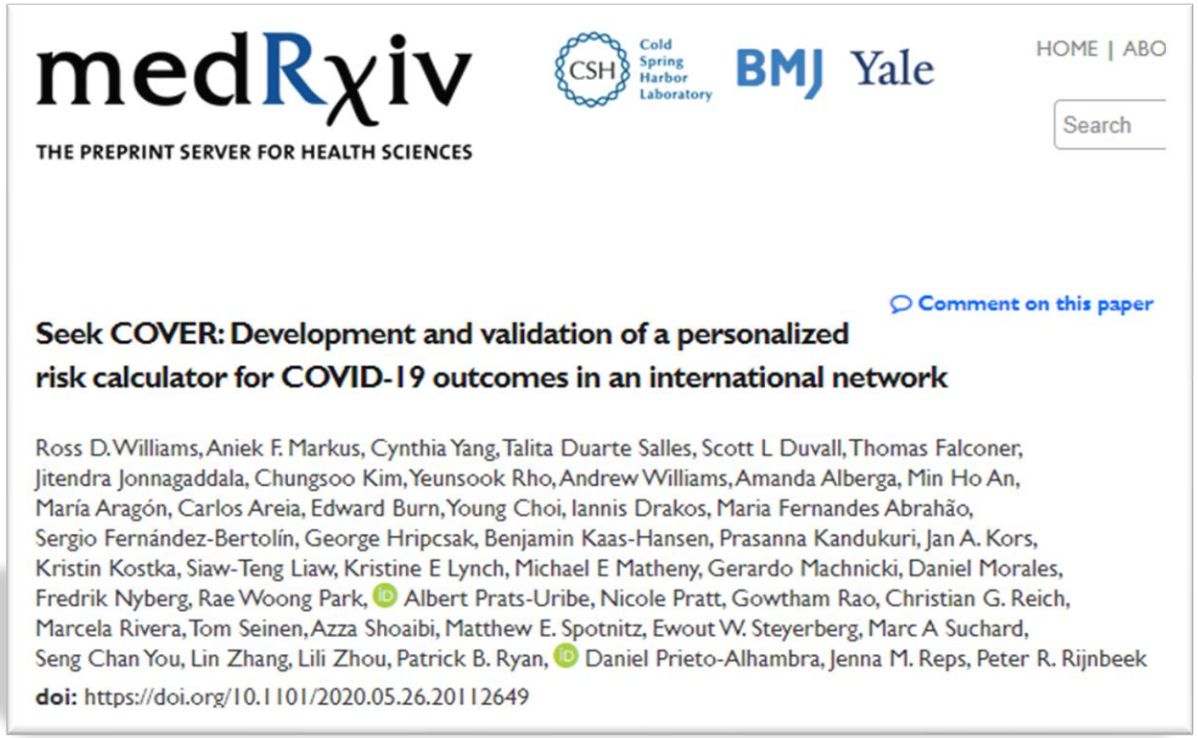


Prediction

COVER: COVID risk prediction

Objective: develop and externally validate **COV**ID-19 **E**stimated **R**isk scores that quantify a patient's risk of hospital admission, hospitalization requiring intensive services or fatality.



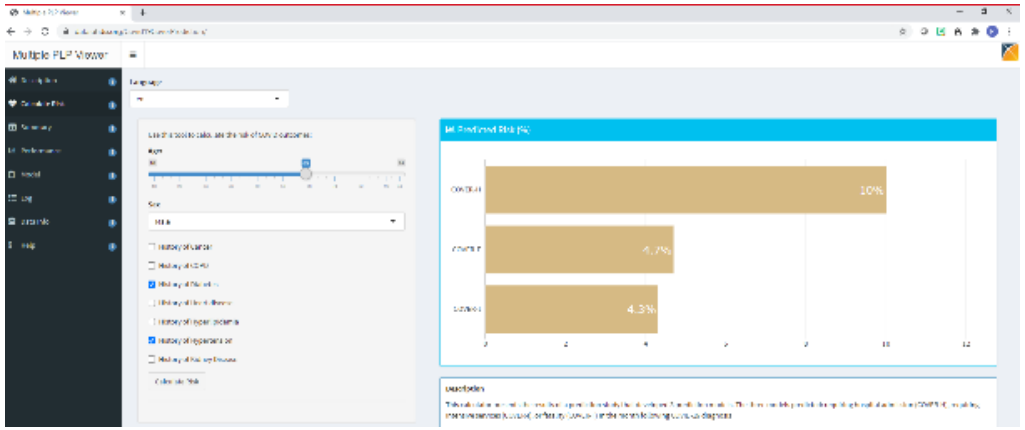


Under review

Prediction

COVER: COVID risk prediction

- COVER interactive website to provide live risk scores



- Impact: Health minister of Catalonia Spain explicitly mentions the COVER index as one of the indicators they will use to measure the impact of a given outbreak.

Prediction

COVER: COVID risk prediction

Interactive application for exploring prediction:

- https://data.ohdsi.org/Covid19CoverPrediction/

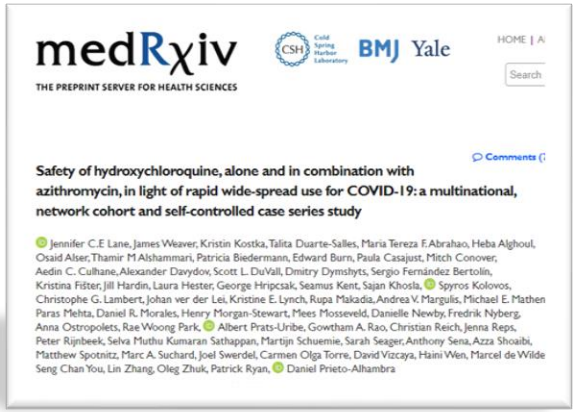
https://www.ohdsi.org/2020-ohdsi-global-symposium/

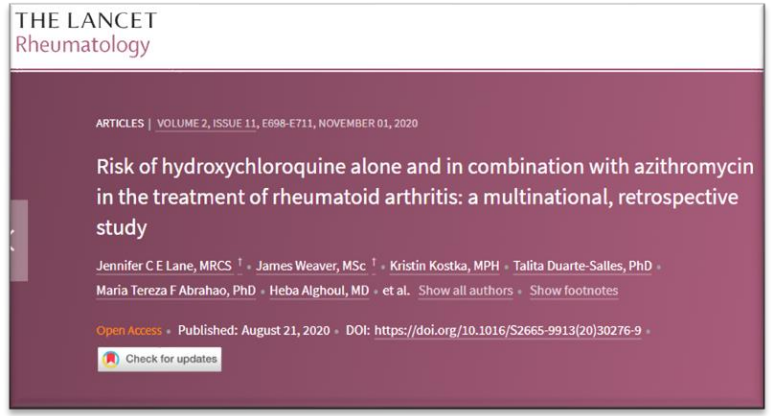
Estimation

Safety of hydroxychloroquine

- Evidence was needed around the use of hydroxychloroquine (HCQ) alone and in combination with azithromycin (AZ). We examined the use of these drugs in rheumatoid arthritis (RA) patients.

- Findings:
  - In history use in RA population, HCQ alone is generally safe but in combination with AZ it shows a doubling of risk of 30-day cardiovascular mortality.

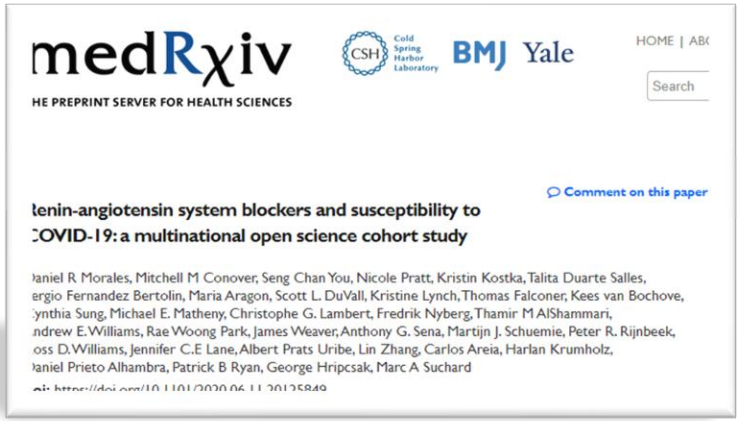




Estimation

ACE Inhibitors and susceptibility to COVID-19

- Patients with cardiovascular diseases and hypertension treated with angiotensin converting enzyme inhibitors (ACEs) angiotensin-II receptor blockers (ARBs) may influence susceptibility to COVID-19 and worsen its severity.



Accepted at *Lancet Digital Health*

As stated by Watson et al.in relation to one of the published studies, lack of transparency and uncertainties about research standards applied raise doubts about published results. Morales et al. supported the reproducibility of their study by publishing the study protocol in the EU PAS Register ahead of time, providing a start-to-finish executable code, facilitating the sharing and exploration of the complete result set with an interactive web application and asking clinicians and epidemiologists to perform a blinded evaluation of propensity score diagnostics for the treatment comparisons.

Estimation

Insights from LEGEND


THE LANCET

Log in

ARTICLES | VOLUME 394, ISSUE 10211, P1816-1826, NOVEMBER 16, 2019

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

Prof Marc A Suchard, MD • Martijn J Schuemie, PhD • Prof Harlan M Krumholz, MD • Seng Chan You, MD • RuiJun Chen, MD • Nicole Pratt, PhD • et al. Show all authors

Published: October 24, 2019 • DOI: https://doi.org/10.1016/S0140-6736(19)32317-7 • Check for updates

PlumX Metrics

Summary


Research

JAMA Internal Medicine | Original Investigation

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

George Hripcsak, MD, MS; Marc A. Suchard, MD, PhD; Steven Shea, MD; RuiJun Chen, MD; Seng Chan You, MD; Nicole Pratt, PhD; David Madigan, PhD; Harlan M. Krumholz, MD, SM; Patrick B. Ryan, PhD; Martijn J. Schuemie, PhD

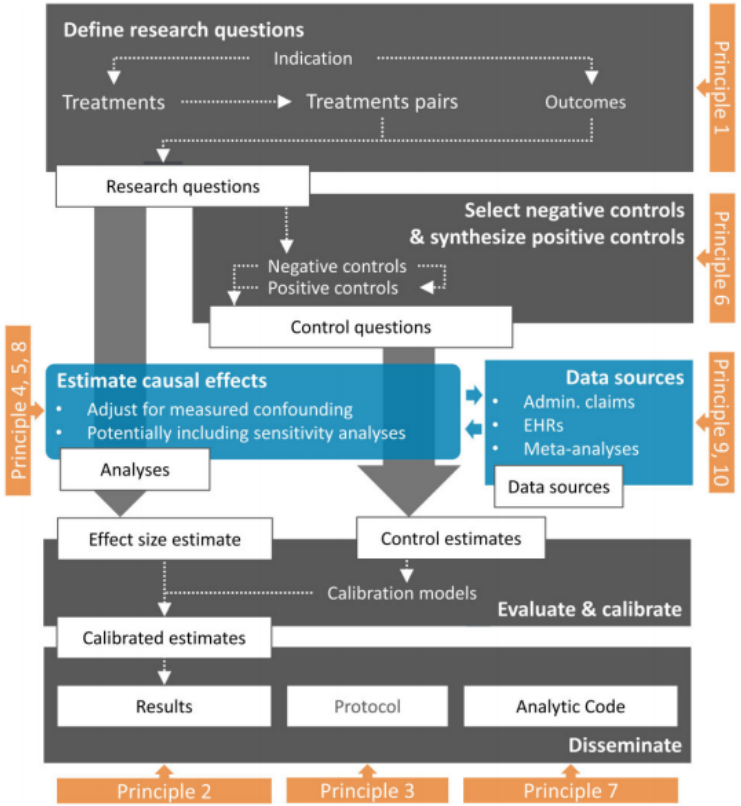
- We are able to generate **high-quality** real-world evidence at large scale
  - **Advanced methods** to address confounding
  - Wide array of **study diagnostics**
  - Negative and positive **controls**
  - **Full transparency** negates p-hacking and publication bias
- Thus **augmenting evidence from clinical trials**
- Importance of **cross-organizational collaboration**
  - Janssen
  - UCLA
  - Yale
  - Columbia University
  - Ajou University
  - University of South Australia

Journal of the American Medical Informatics Association, 0(0), 2020, 1331–1337
doi: 10.1093/jamia/ocaa103
Perspective

Perspective

Principles of Large-scale Evidence Generation and Evaluation across a Network of Databases (LEGEND)

Martijn J. Schuemie[1,2], Patrick B. Ryan[1,3], Nicole Pratt[4], RuiJun Chen[3,5], Seng Chan You[6], Harlan M. Krumholz[7], David Madigan[8], George Hripcsak[3,9], and Marc A. Suchard[2,10]

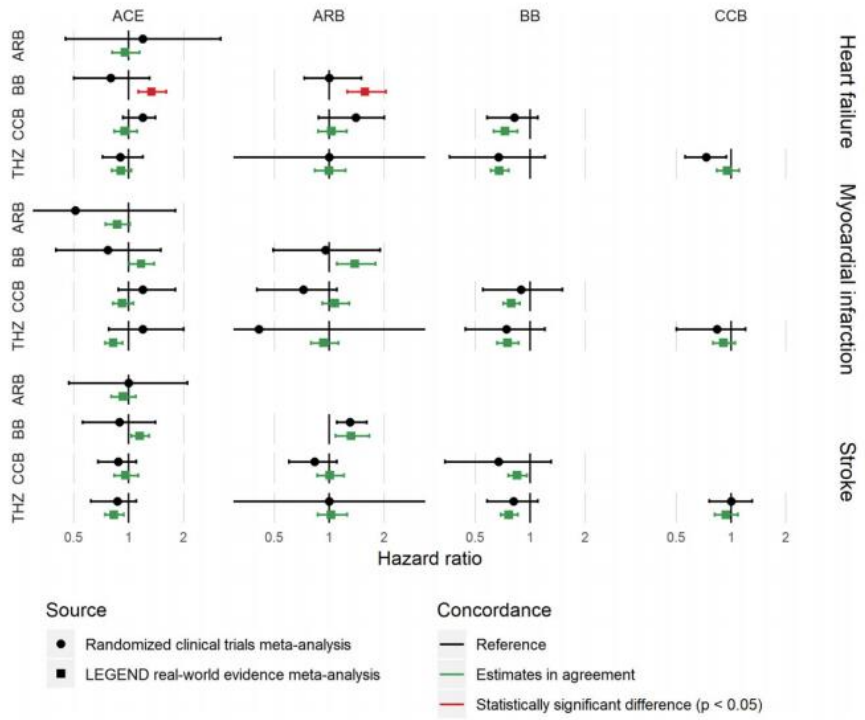


Journal of the American Medical Informatics Association, 0(0), 2020, 1268–1277
doi: 10.1093/jamia/ocaa124
Research and Applications

Research and Applications

Large-scale evidence generation and evaluation across a network of databases (LEGEND): assessing validity using hypertension as a case study

Martijn J Schuemie[1,2] Patrick B Ryan,[1,3] Nicole Pratt,[4] RuiJun Chen[3,5] Seng Chan You,[6] Harlan M Krumholz,[7] David Madigan,[8] George Hripcsak,[3,9] and Marc A Suchard[2,10]



Estimation

Leadership role of APAC

Research

JAMA | Original Investigation

Association of Ticagrelor vs Clopidogrel With Net Adverse Clinical Events in Patients With Acute Coronary Syndrome Undergoing Percutaneous Coronary Intervention

Seng Chan You, MD, MS; Yeunsook Rho, PhD; Behnood Bikdeli, MD, MS; Jiwoo Kim, MS; Anastasios Siapos, MSc; James Weaver, MSc; Ajit Londhe, MPH; Jaehyeong Cho, BS; Jimyung Park, BS; Martijn Schuemie, PhD; Marc A. Suchard, MD, PhD; David Madigan, PhD; George Hripcsak, MD, MS; Aakriti Gupta, MD, MS; Christian G. Reich, MD; Patrick B. Ryan, PhD; Rae Woong Park, MD, PhD; Harlan M. Krumholz, MD, SM

IMPORTANCE Current guidelines recommend ticagrelor as the preferred P2Y12 platelet inhibitor for patients with acute coronary syndrome (ACS), primarily based on a single large randomized clinical trial. The benefits and risks associated with ticagrelor vs clopidogrel in routine practice merits attention.

OBJECTIVE To determine the association of ticagrelor vs clopidogrel with ischemic and hemorrhagic events in patients undergoing percutaneous coronary intervention (PCI) for ACS in clinical practice.

DESIGN, SETTING, AND PARTICIPANTS A retrospective cohort study of patients with ACS who underwent PCI and received ticagrelor or clopidogrel was conducted using 2 United States electronic health record–based databases and 1 nationwide South Korean database from

Editorial page 1613

JAMA Patient Page page 1690

Audio and Supplemental content

CME Quiz at jamacmelookup.com and CME Questions page 1672

OHDSI APAC 2020 Symposium Agenda

Korean Time	OHDSI APAC 2020 Session and Title - Dec 5th
10:00 - 10:30	OHDSI Welcome Session
10:30 - 11:30	Panel – OHDSI Community in Action – COVID19 Global effort
11:30 - 12:30	Network Session
12:30 - 13:30	APAC Study - Comprehensive comparative effectiveness and safety of second line antihypertensive agents; utilising the LEGEND principles to mobilize collaboration across the OHDSI APAC network
13:30 - 14:00	DOAC Study - Comparative effectiveness and safety of direct ORal Anticoagulants in patients with atrial fibrillation: a standardiZed Observational data Network study (CORAZON)
Korean Time	**OHDSI APAC 2020 Session and Title - Dec 6th**
10:00 - 10:30	OHDSI APAC State of the Community
10:30 - 13:00	OHDSI Chapter Breakout – China/Hong Kong, Australia, Singapore, Korea, Taiwan, Japan
13:00 - 13:30	Fun with the Community
13:30 - 14:00	Closing Ceremony

COLLABORATOR SHOWCASE - POSTERS

Name	Affiliation	Poster
Zachary Monge	Covance	A Hybrid Statistical-Machine Learning Approach to Anomaly Detection in Clinical Trial Data
Ty Stanford	University of South Australia	Mapping to standardised vocabularies: a process for drug codes in Australia
Guy Tsafnat	Evidentli	AI-powered data mapping
Jason C. Hsu	Taipei Medical University	Taipei Medical University Clinical Research Database (TMUCRD): A New Application Platform that Integrates Multi-center Electronic Medical Record Systems in Taiwan
Gang Wang	Beijing Anding Hospital affiliated to Capital Medical University	Treatment Patterns and Risk of Switch to Mania in Bipolar Depressive Patients Treated with Antidepressants: A real world study using the OHDSI Network
Gang Wang	Beijing Anding Hospital affiliated to Capital Medical University	Transforming the Psychiatric Hospital Database to the OMOP Common Data Model in China
Preetham Kadappu	School of Medical Sciences, University of New South Wales	Statin Prescribing Patterns and Residual CRP Risk on Hospitalisation in a South-Western Sydney Population

OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

Community in Action Panel