OHDSI
State of the Collaborative

OHDSI's mission

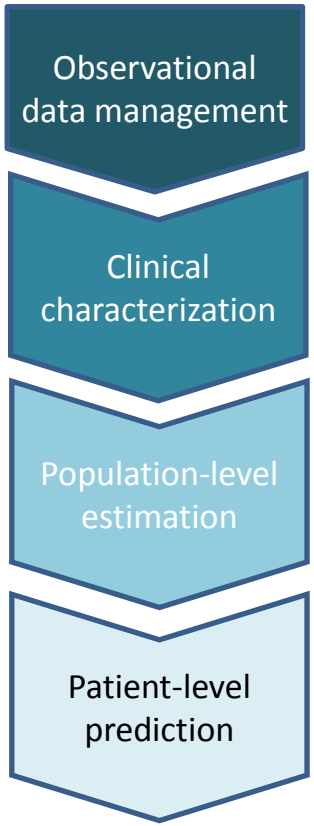
To improve health, by empowering a community to collaboratively generate the evidence that promotes better health decisions and better care

Odyssey (*noun*): \oh-d-si\

1. A long journey full of adventures
2. A series of experiences that give knowledge or understanding to someone

http://www.merriam-webster.com/dictionary/odyssey

OHDSI's areas of focus: Our goals for 2017…



- Maintain and evolve open community data and vocabulary standards
- Develop and improve tools to enable large-scale analysis
- Establish and promote community best practices
- Strengthen and expand collaborations across OHDSI research network
- Advance scholarship in observational data science through publication, presentations, and education
- **Generate and disseminate more clinical evidence**

Listening to the journeys of our collaborators

- Martijn
- Nigam
- Seng
- Vojtech
- George
- Rimma
- Christian
- Hua
- Sigfried
- Clair
- Greg
- Peter

Martijn Schuemie, PhD

Director, Epidemiology Analytics
Janssen Research and Development

Population-level effect estimation workgroup:

- Further development of the Methods Library
  - E.g. added case-crossover and case-time-control designs
- Created the Method Benchmark
  - 200 negative controls + 600 positive controls
- Method Library evaluation + validation
  - Almost finished white paper documenting validation steps
- Application of Methods Library
  - Levetiracetam vs phenytoin for risk of angioedema (published)
  - Alendronate vs Raloxifene for risk of hip fracture (SOS Study)
  - Comparison of hypertension treatments (led by Ajou University)
  - Diabetes treatment pathways (led by Stanford)
- Paper on large-scale population level estimation was rejected by 4 journals
  - As seen at the OHDSI 2016 Symposium

Nigam Shah, MBBS, PhD

Associate Professor of Medicine, Biomedical Informatics Research
Stanford University School of Medicine

- We participated in 5 network studies and are leading one network study
- We incorporated ‘anchor and learn’ into the APHRODITE package, and built 10 phenotype models
- We pushed for a few extensions to the CDM
- We convinced our institution to adopt OHDSI tools for site-wide usage

Seng Chan You, MD, MS

Medical Doctor and PhD candidate
Department of Biomedical Informatics, Ajou university

- The journey I've been on
  - Joined the OHDSI 2016
  - Joined the OHDSI collaborative research at Mar 2016
    - SeaWAS
  - Launched OHDSI collaborative research at Sep 2016
    - Comparative effectiveness research on hypertensive medication
    - Best community contribution award for clinical evidence generation in OHDSI 2017
  - Launched SOS challenge study in Korea
    - Four tertiary Korean hospitals joined this study as data supporters
  - Developed soft-wares
    - Deep Learning model for patient-level-prediction (CIReNN)
    - GIS visualization tool (AEGIS)
  - Suggested expansion model for genomics

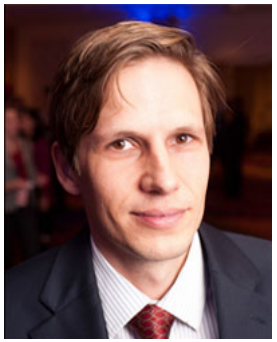
Seng Chan You, MD, MS

Medical Doctor and PhD candidate
Department of Biomedical Informatics, Ajou university

- The ambitious goal in 2018
  - Help other institutions and Asian countries to join OHDSI
    - Twenty more Korean hospitals decited to join OHDSI
    - Now I’m working in Singapore
  - Suggest more expansion models
    - Radiology
    - Lifelog data
    - National Language Processing for Korean
  - Release advanced version of software
    - Integrating CIReNN into PLP package
    - Develop FeatureExtraction package for genomic data

Vojtech Huser, MD, PhD

Staff Scientist, Lister Hill National Center for Biomedical Communications, National Library of Medicine
National Institutes of Health



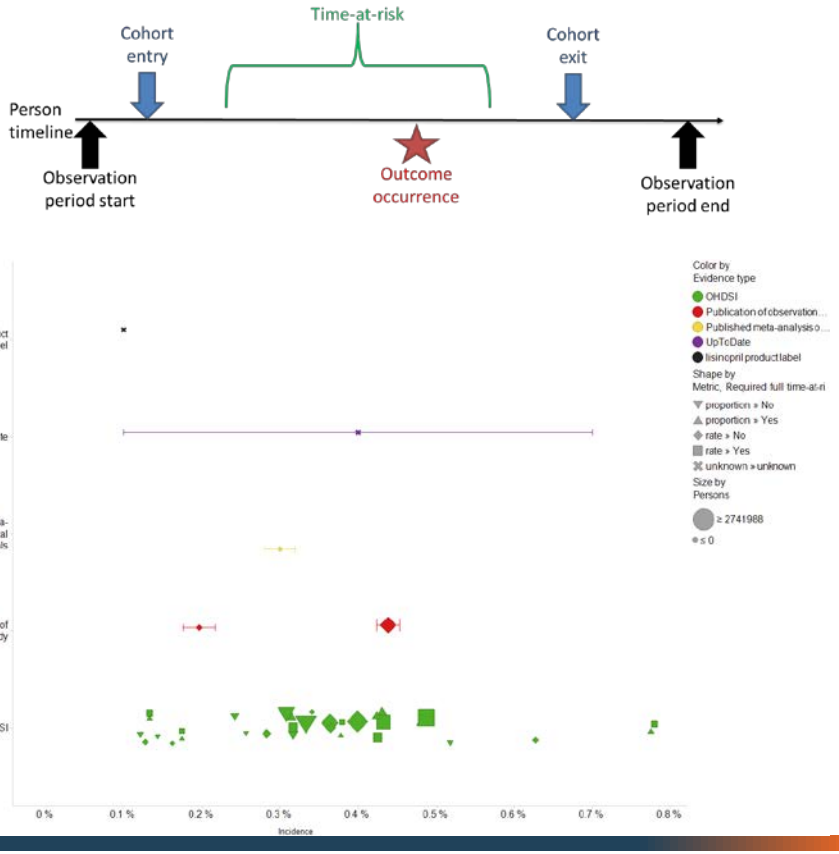
Data Quality

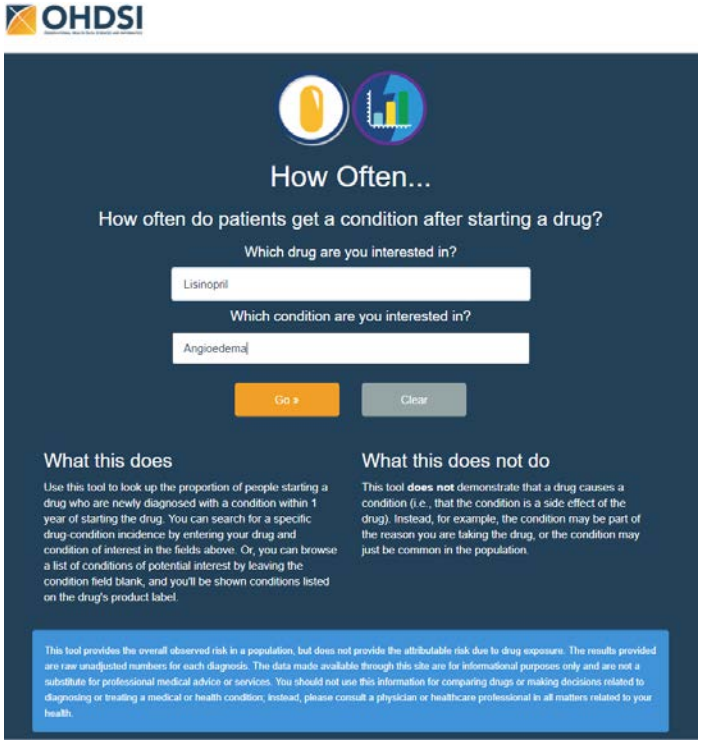
- Past
  - Extended rules in Achilles Heel (model conformance rules, data quality rules)
  - Notification severity added
  - Study 1: Achilles Heel Evaluation
  - Learn from PEDSNet, Sentinel (ongoing)
- Future
  - Data cycle concept (annual evaluation)
  - R package OHDSI/DataQuality (internal execution, network study)
  - Data Quality Network Evaluation (only participating slides)
    - Provide feedback to the network sites
    - Determine empiric thresholds for future releases of Achilles Heel
  - High quality “notification”

George Hripcsak, MD, MS

Vivian Beaumont Allen Professor and Chair of Biomedical Informatics
Columbia University Medical Center

Large-scale incidence characterization

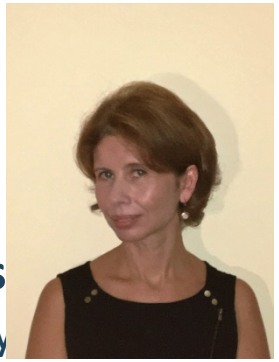




howoften.org

Rimma Belenkaya, MA, MS

Data Modeler/Knowledge Manager
Memorial Sloan Kettering Cancer Center



- **Cancer research is not supported by OMOP CDM and OHDSI tools**
  - Identification and follow-up of patients with a certain disease phenoty
  - Identification of treatment regimen and response to treatment
  - Identification of recurrences and progression of disease
  - Prediction of recurrences, length of remissions, end of life events

- **Major challenges**
  - Source data challenges
  - Modeling and terminology challenges
  - Analytical derivation of the key disease features challenge

- **Oncology Wokgroup initiated in March 2017**

- **Accomplished so far and in progress**
  - Mapping of ICD-O to SNOMED to represent cancer diagnosis - done
  - Proposal for representation of cancer diagnostic features- in progress
  - Cancer treatment proposal – in progress

Christian Reich, MD, PhD

VP RWE Systems, IQVIA

FDA Biologics Evaluation and Safety Initiative (BEST)

U.S. FOOD & DRUG ADMINISTRATION

OHDSI
Observational Health Data Sciences and Informatics

Report back

65 studies:
- Simple: Rapid queries
- Medium complexity: cohort characterization
- High complexity: safety, pharmacoepi

AE Reports

Develop Studies/Reports

UCLA → Develop new methods

Run Studies/Reports

Create MedWatch submission module

Columbia University in the City of New York

Stanford Medicine Biomedical Informatics

Hospital Charge Master

LRxDx Provider-based Claims

Ambulatory EMR

Other OHDSI Collaborators

Georgia Institute of Technology → Add unstructured data through NLP

IMS Health & Quintiles are now IQVIA

On invitation

Hua Xu, PhD

Robert H. Graham Professor in Entrepreneurial Biomedical Informatics and Bioengineering
University of Texas Health Science Center at Houston

- OHDSI China Working Group
  - Six sub-groups: CDM and vocabulary, data analysis, natural language processing, software tools, Privacy and Community engagement
  - Monthly meetings
  - 2017 F2F meeting in Hangzhou
  - 2018 F2F meeting will be in Guangzhou

Sigfried Gold, MA, MFA

Information Visualization Researcher and Consultant
PhD Student, Human-Computer Interaction Lab, iSchool, University of Maryland

- Participated in calls, working groups, symposium planning committee
  - Always impressed by how open, welcoming, productive, and brilliant this community is
- There was lots of interest when I started the vocab-visualization working group.
  - It petered out though because I was focused on a specific challenge which has proved to be really hard. I'm still working on it and would welcome collaborators.
  - We could revive it if someone else wants to lead.
- Email me at sigfried@sigfried.org

Clair Blacketer, MPH, PMP

Manager, Epidemiology Analytics
Janssen Research & Development

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Home

Edit | New Page

clairblacketer edited this page 7 days ago · 23 revisions

OMOP Common Data Model v5.3 Specifications

Authors: Christian Reich, Patrick Ryan, Rimma Belenkaya, Karthik Natarajan, Clair Blacketer
3 January 2018

Welcome to the Common Data Model wiki! This wiki houses all of the documentation for the latest version as well as changes added with each release. You can find a pdf added to each release with a historical version of the wiki as it was at the time of the release. You can navigate the pages using the table of contents below or the links to the right.

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License

Background
The Role of the Common Data Model
Design Principles
Data Model Conventions
Frequently Asked Questions

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Home
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Glossary of Terms

OHDSI / CommonDataModel

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Filters | is:issue is:open | Labels | Milestones | New issue

48 Open | 55 Closed | Author | Labels | Projects | Milestones | Assignee | Sort

- Not null vocabulary_version column conflicts with data in CSVs downloaded from Athena bug — #149 opened 10 hours ago by pavgra
- stop_reason_source_value should be varchar bug — #147 opened 4 days ago by gowthamrao
- minor layout issue of DDL enhancement — #146 opened 4 days ago by PRijnbeek
- Visit_detail_concept_id — #145 opened 4 days ago by gowthamrao
- Mis-spelled revenue code Dev — #144 opened 5 days ago by gowthamrao
- DM_v5.2 document typo — on Dec 12, 2017 by hello-kukoo
- ry Discussion — on Dec 5, 2017 by clairblacketer

QUESTIONS | RESPONSES 12

CDM Proposal Vote - Cost Table Additions

This is the vote for CDM proposal #81 (https://github.com/OHDSI/CommonDataModel/issues/81)

Please type your name here

Short answer text

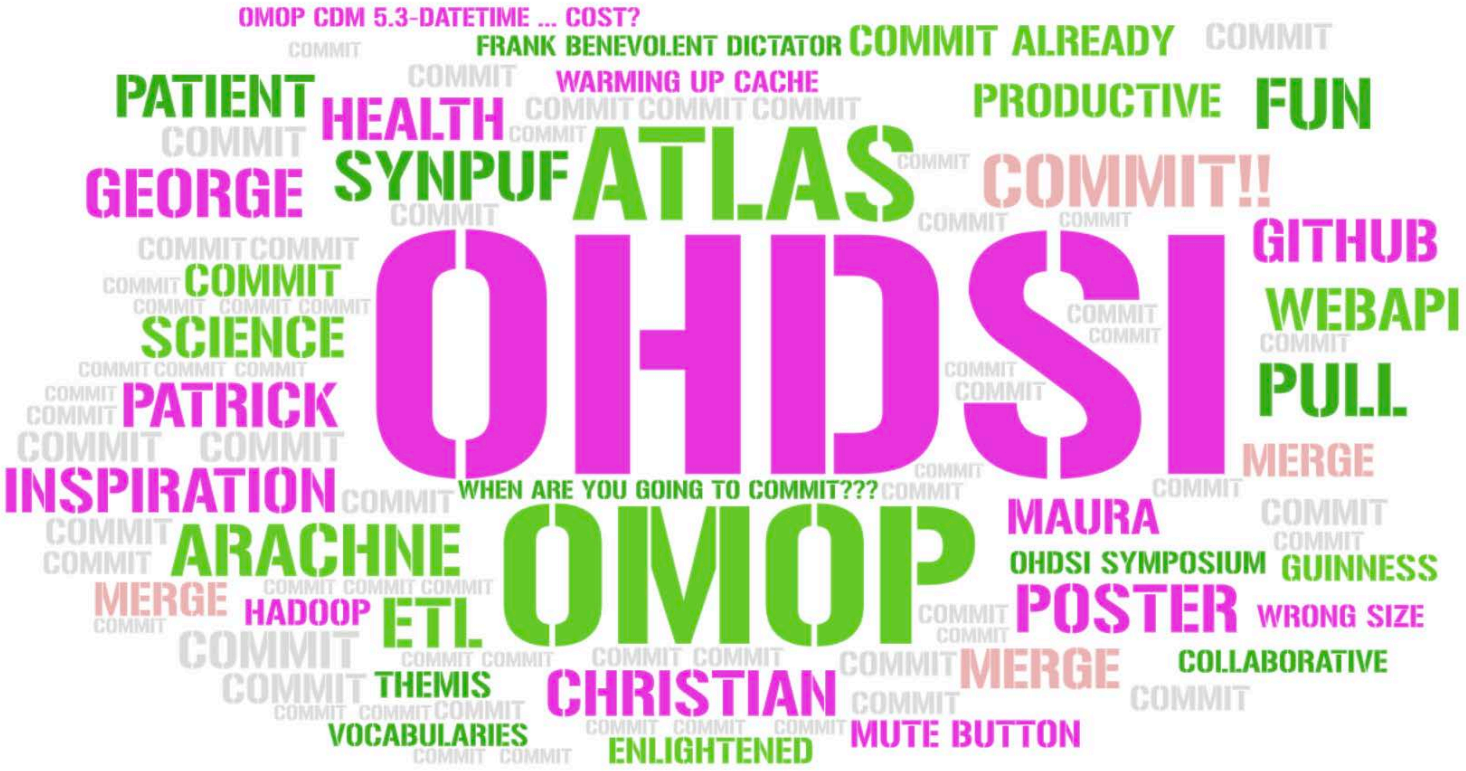
Should the first three points of the Cost Table Additions proposal be accepted into a future version (TBD) of the OMOP CDM?

- ○ Yes
- ○ No

Gregory Klebanov, MS

Chief Technology Officer
Odysseus Data Services, Inc.

A few words in my mind that describe the OHDSI 2017 journey:



Gregory Klebanov, MS

Chief Technology Officer
Odysseus Data Services, Inc.

2018 Room for Improvement Or “The Emperor’s Clothes”?

- Reproducible and transparent observational research, but with email and forum posts?
- It is harder than you think to make a “working” open source tool to work outside of the author’s environment...
- The Common Data Model is not that ”Common”...

Peter Rijnbeek, PhD

Assistant Professor
Erasmus University Medical Center

Building a European OHDSI Community

http://www.ohdsi-europe.org

- Strong interest in OHDSI in Europe (Pharma, Academics, Regulators etc..)
- Several projects are ongoing and are being initiated to expand the European Data Network (EMIF, EHDN, national initiatives: UK, Sweden, Germany, etc..)
- European OHDSI Initiative aims to support the adoption of the OMOP-CDM in Europe and supports database mapping, research initiatives, expansion of Standardized Vocabularies to European Market, interaction with regulators, training -> Join our European OHDSI Journey!

First Annual Symposium of the European Observational Health Data Sciences and Informatics Initiative: March 23-24th 2018 in Rotterdam The Netherlands

www.ohdsi-europe.org

Peter R. Rijnbeek, PhD[1] , Johan van der Lei, PhD[1]

Department of Medical Informatics, Erasmus MC, Rotterdam, The Netherlands

Background

The Observational Data Sciences and Informatics (OHDSI) initiative strives to bring out the value of observational health data through large-scale analytics. This highly multi-disciplinary research community has developed an impressive set of tools and methods to perform our future pharmacoepidemiological studies in a transparent and reproducible way. The interest for the OMOP-CDM and OHDSI in general is growing strongly in Europe and we aim to further stimulate collaboration among the stakeholders. The European chapter aims to get more interested collaborators on board so we can continue the exciting OHDSI journey at scale in Europe.

Currently, several projects in Europe are using the OMOP-CDM to improve the semantic and syntactic operability of the data sources. For example, the European Medical Information Framework (EMIF) project has mapped 10 European databases (GP, Hospital, Claims, Biobank) to the OMOP-CDM and is currently evaluating these conversions. This exercise provides important insights. First, we need to further improve the OMOP-CDM and the standard vocabularies from the European perspective. Second, conversion of databases is a task that requires an experienced multi-disciplinary team and we need to make sure that the Extraction Transformation and Loading process is of high quality. This requires we develop the right expertise in Europe and have to share our experience.

The Department of Medical Informatics will serve as the coordinating center for the European OHDSI initiative (see www.ohdsi-europe.org) in close collaboration with the global community led by Columbia University. We will organize an annual OHDSI symposium to allow all stakeholders to share their research results and share their insights in how to further improve the OMOP-CDM and standard vocabularies from the European perspective.

Why a European coordinating center?

1. Stimulate transparent and reproducible research in Europe

Transparent and reproducible research is our goal and we believe that this cannot be achieved without proper data standardization. The OMOP-CDM is becoming the de-facto standard for health data across the world and has proven its value. We like to stimulate the adoption of the OMOP-CDM in Europe for this reason.

2. European challenges

Improving interoperability is challenging in Europe because of the large amount of vocabularies and data structures used in the different countries. Local expertise is required to extend the OHDSI standard vocabularies to capture all European coding systems. Moreover, we like to systematically evaluate the CDM structure for our European data and future studies. Coordination of this important task is needed.

3. Regulatory interest

The OMOP-CDM and analytical tools allow for more efficient pharmacovigilance which is beneficial for the patient. Regulators have shown interest in the OHDSI initiative and like to evaluate its use in Europe. Having a European coordinating center has clear benefits for interaction with the regulators.

4. Community building

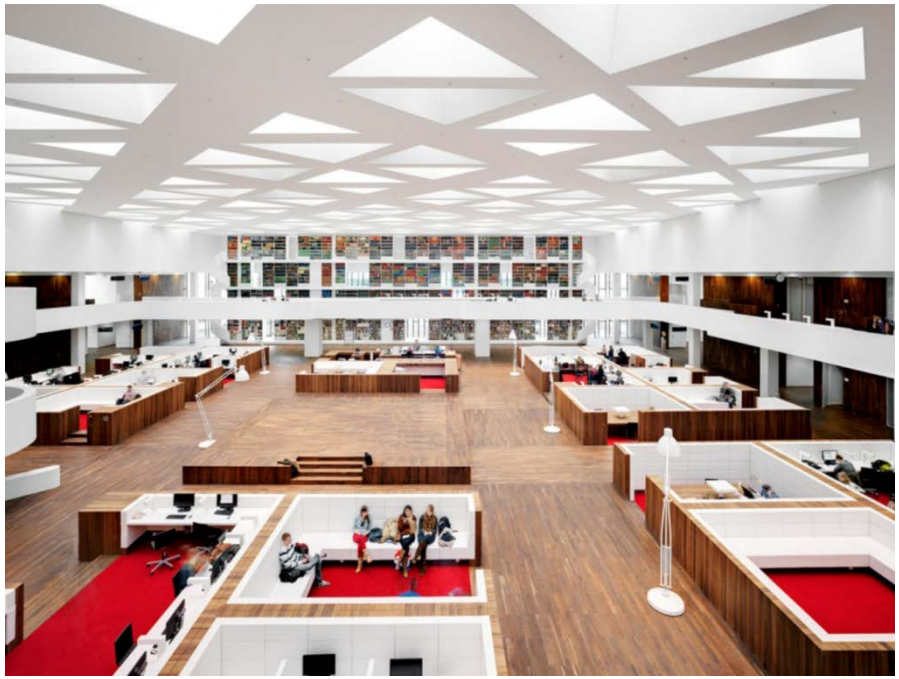
We like to strengthen the European contribution to the global OHDSI community. We can contribute in tool development and also of course participate in large global studies that have not been possible before. Furthermore, we need to educate all the stakeholder to guarantee high quality in data transformation and usages. We also need to get insight in all OMOP-CDM related activities in Europe and work together as much as possible.

Conclusions

The European OHDSI Initiative will build an active community in Europe that will actively contribute to the extension of tools, improvement of the vocabularies, and will help in educating the future professionals. The first annual symposium will be on March 23th 2018 and several tutorials will be offered March 24th. We invite all disciplines to join this initiative and join our European journey.

European OHDSI Symposium

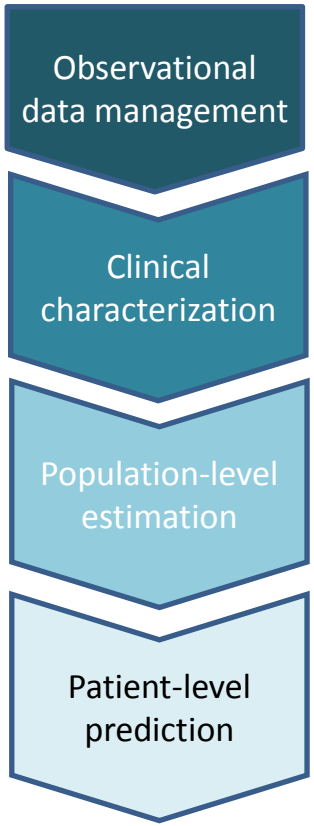
- http://www.ohdsi-europe.org
- Max 250 places ! Register!
- Opportunity for sponsorship
- Collaborator showcase
- Posters



- Presentations from European projects that use OMOP-CDM
- Panels on European Implementation

A recap of our journey

OHDSI's areas of focus: Our goals for 2017…



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OMOP CDM v5.3 …released!

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Releases | Tags | Draft a new release

Latest release

CDM v5.3.0

Edit

Thanks to Rimma Belenkaya, Christian Reich, and Clair Blacketer for leading our community data model stewardship!

This version is based on the pull requests and CDM proposals:

- #64 This removes the datetime fields from OBSERVATION_PERIOD
- #70 Adds the VISIT_DETAIL table
- #79 Adds the METADATA table
- #92 Fixes modifier typo in PROCEDURE_OCCURRENCE
- #120 Adds the following fields to PAYER_PLAN_PERIOD:

Journey toward open-source analytics development

ATLAS/WebAPI – a single community platform for:

-vocabulary browsing
-database characterization
-cohort definition
-cohort characterization
-incidence rate estimation
-patient profile exploration
-population-level effect estimation design

Thank you teams from Columbia, Google, Cloudera, Erasmus MC, Odysseus, BlueCrossBlueShield-South Carolina, Regenstrief, Janssen for contributing to the ATLAS 2.2 release!

Demo at http://ohdsi.org/web/ATLAS

Estimation methods

Cohort Method

New-user cohort studies using large-scale regression for propensity and outcome models

Self-Controlled Case Series

Self-Controlled Case Series analysis using few or many predictors, includes splines for age and seasonality.

Self-Controlled Cohort

A self-controlled cohort design, where time preceding exposure is used as control.

IC Temporal Pattern Disc.

A self-controlled design, but using temporal patterns around other exposures and outcomes to correct for time-varying confounding.

Case-control

Case-control studies, matching controls on age, gender, provider, and visit date. Allows nesting of the study in another cohort.

Case-crossover

Case-crossover design including the option to adjust for time-trends in exposures (so-called case-time-control).

Thank you Martijn Schuemie, Marc Suchard, Peter Rijnbeek, and Jenna Reps for leading methods research and development efforts!

Method charac

exposure-outcome pairs to profile and calibrate a particular analysis design.

reference sets as well as simulations injected in real data to evaluate the performance of methods.

Supporting packages

Database Connector

Connect directly to a wide range of database platforms, including SQL Server, Oracle, and PostgreSQL.

Sql Render

Generate SQL on the fly for the various SQL dialects.

Cyclops

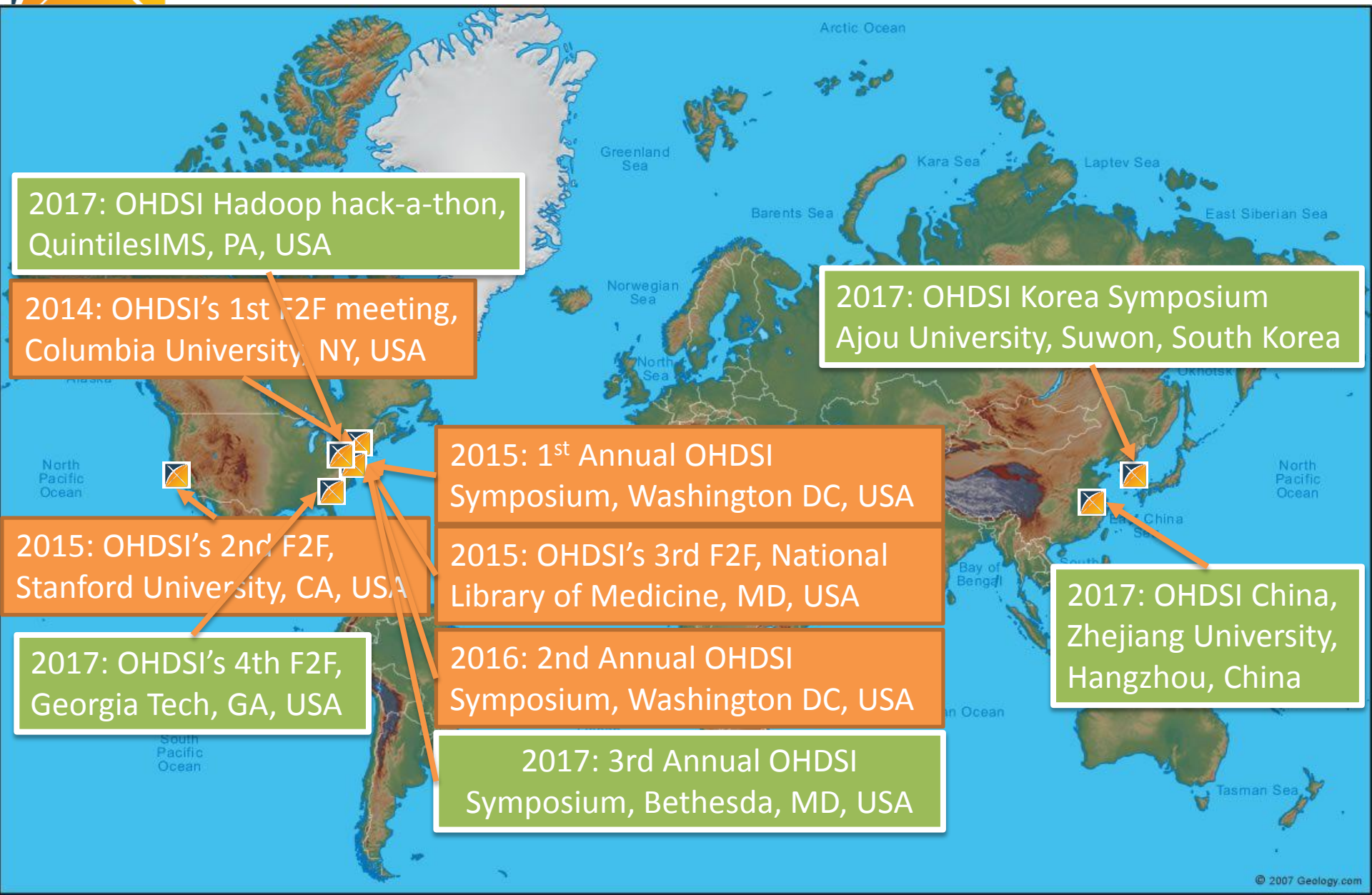
Highly efficient implementation of regularized logistic, Poisson and Cox regression.

Ohdsi R Tools

Support tools that didn't fit other categories, including tools for maintaining R libraries.

Under construction

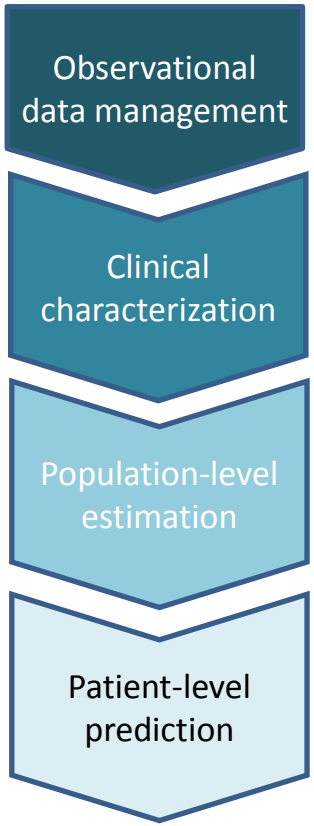
Our journey in 2017



2017 OHDSI symposium by the numbers

- 437 collaborators registered
  - 118 different organizations
  - 47 participants from 14 different countries on 4 continents
  - US collaborators hailing from 29 states
  - 48 friends from FDA
- 62 contributions (46 posters, 9 software demos, 7 lightning talks) during the OHDSI collaborator showcase
- 14 sponsors provided support
- 1 presentation started in PowerPoint and ended in an art gallery

OHDSI's areas of focus: Our goals for 2017…



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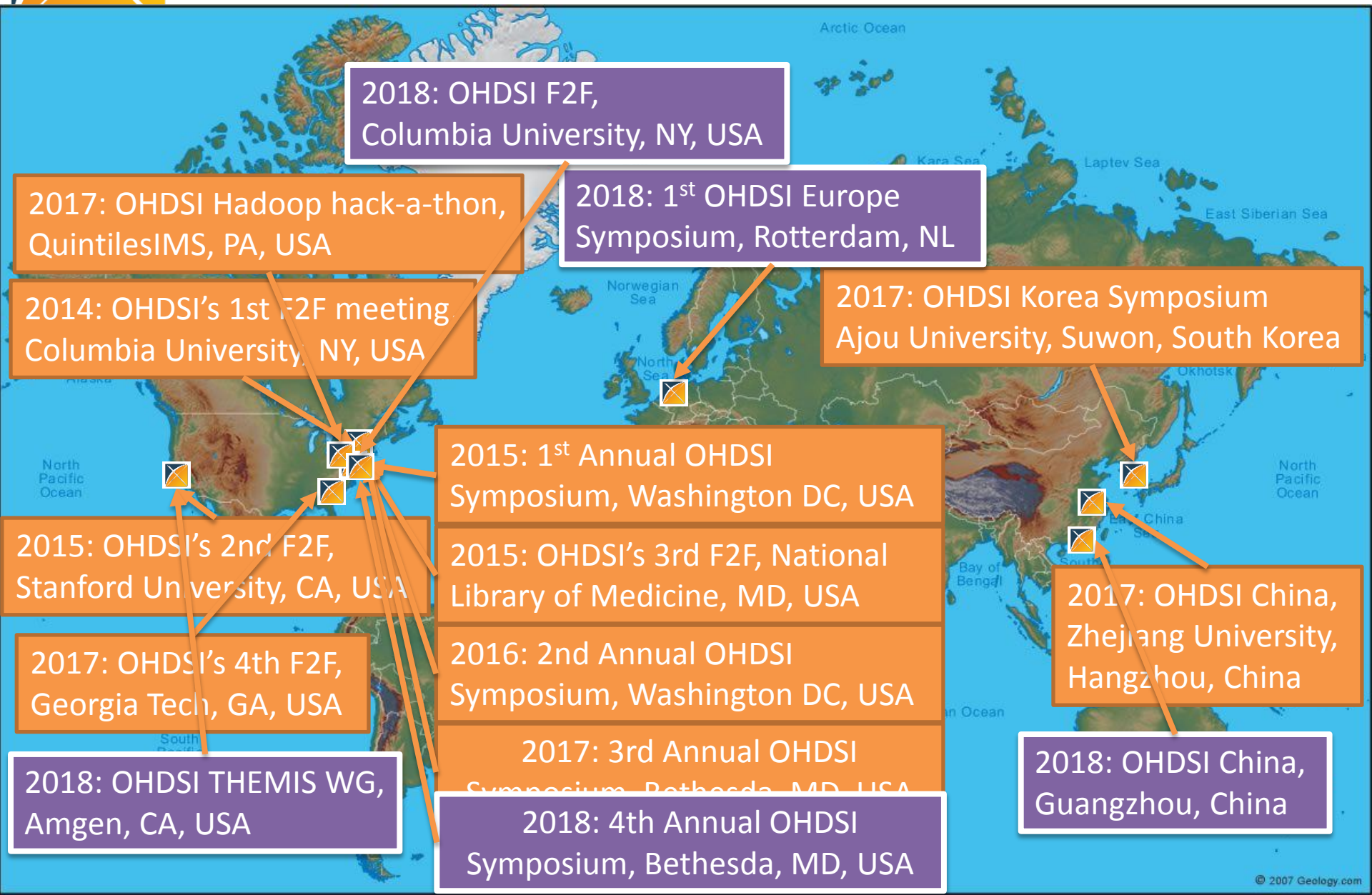
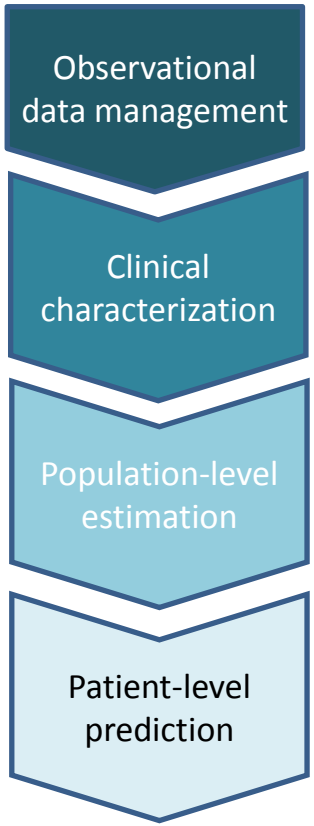
The journey ahead…



OHDSI's areas of focus: Continuing our journey in 2018…



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Thank you the community!

We’re all in this journey together…