How you get the OHDSI Network effect
OHDSI的协作网络效应

Christian Reich
OHDSI China Symposium
29-Jun-2018
OHDSI’s vision
OHDSI的愿景

OHDSI collaborators access a network of 1 billion patients to generate evidence about all aspects of healthcare. OHDSI合作者访问10亿患者的网络，以生成有关医疗保健各方面的证据。

Patients, clinicians and other decision-makers around the world use OHDSI tools and evidence every day. 世界各地的患者，临床医生和其他决策者每天都使用OHDSI工具和证据。
"What's the adherence to my drug in the data assets I own?"

Current Approach: “One Study – One Script”

Analytical method: Adherence to Drug

Application to data

Current solution:

One SAS or R script for each study

- Not scalable
- Not transparent
- Expensive
- Slow
- Prohibitive to non-expert routine use
Solution: Data Standardization Enables Systematic Research

OHDSI Tools 工具

OMOP CDM 准化数据模型
Analytics can be remote
分析可以是远程的
Analytics can run behind firewall

分析可以在防火墙后运行
Network Studies
Networks of networks

Coordinate Center

Another Network

Network
Example for Existing Network: FDA BEST

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

AE Reports

**Develop Studies/Reports**

**Run Studies/Reports**

**Create MedWatch submission module**

**Hospital Charge Master**

**Ambulatory EMR**

**LRxDx Provider-based Claims**

**Add unstructured data through NLP**

**Develop new methods**

**UCLA**

**BEST Network**
Making the Network Sustainable

网络可持续化
A) Incentives for the Node

对网络节点的激励

- Enabling data for research 为研究服务的数据
- ~Free Tools, Methods 免费工具，方法
  - Vocabulary browsing 词汇浏览
  - Population characterization 人群特征
  - Adjudication and validation 决断和确认
  - Population-based estimation 基于人群的估计
  - Patient-level prediction 基于病人的预测
- Quality benchmarks 质量基准
- Scientific reputation 科学声誉
- Potentially money 潜在的收入
b) Feeding the Network

加入协作网络的收益

- **Foundational** 基础性
  - CDM 标准化数据模型
  - Vocabulary, Mapping 词汇，映射
  - Community 社群
  - Training 培训

- **Trust** 信任
  - Open Source 开源
  - Nodes keep control over data 参与节点自己掌握和保存自己的数据

- **Methodology** 方法学

- **Technology, tools, automation** 技术，工具，自动化

- **Use cases, scientific impact** 应用案例，科学影响

- **Reciprocity, no autocracy** 互惠，不专制
Resources

CDM 标准化数据模型
Vocabulary 术语集
Training 培训
Forum 论坛
Tools 工具
OMOP CDM Version 5

Standardized clinical data
- Person
  - Observation_period
  - Specimen
  - Death
  - Visit_occurrence
  - Procedure_occurrence
  - Drug_exposure
  - Device_exposure
  - Condition_occurrence
  - Measurement
  - Note
  - Observation
  - Fact_relationship

Standardized health system data
- Location
- Care_site
- Provider
- Payer_plan_period
- Cost

Standardized derived elements
- Cohort
- Cohort_attribute
- Condition_era
- Drug_era
- Dose_era

Standardized health economics

Standardized meta-data
- Concept
- Vocabulary
- Domain
- Concept_class
- Concept_relationship
- Relationship
- Concept_synonym
- Concept_ancestor
- Source_to_concept_map
- Drug_strength
- Cohort_definition
- Attribute_definition
Vocabulary词汇：One Mandatory
一个不可或缺的

All vocabularies stacked up in one table

Reference Table 参考表

Vocabulary ID
Conditions

状态 (疾病)

Classification Concepts

Standard Concepts

Top-level classification

Higher-level classifications

Low-level concepts

Source codes

ICD10  ICD10CM  Read  SNOMED  Oxmis  Ciel  MeSH  ICD9CM

MedDRA

System organ class

High-level group terms

High-level terms

Preferred terms

Low-level terms

Source codes
Why are we mapping? 我们映射什么？

Gëzuar

Ha zdраве

Salut

Na zdravi

Skál

¿Vive?

Proost

Terviseks

Skál

Santé

Salud

 건배

Na здравје

Kippis

Yγεια

Fenékig

Noroc

Salute

$j$ sveikatą

Zum Wohl

Na zdrowie

Priekā

Na здоровье

Sláinte
Tutorials

- OMOP CDM and Vocabulary
- Overview of the OHDSI Analysis
- OHDSI Tech Stack
- Data ETL
- Cohort Definition/Phenotyping
- Patient-Level Prediction
- Population-level Effect Estimation
- Data Quality

2017 Tutorials – OMOP Common Data Model and Standardized Vocabularies

Faculty:
George Hripcsak, Christian Reich, Erica Voss, Karthik Natarajan, Mark Weiz, Mul Van Zandt, Ranna Belenkaya, Don O'Hara, Michael Goodman, Gowtham Rao, Dmitry Dymshytz, Don Torok, Clair Blacketer

Target Audience:
Data holders who want to apply OHDSI's data standards to their own observational datasets and researchers who want to be aware of OHDSI’s data standards so they can leverage data in OMOP CDM format for their own research purposes.

Videos

OHDSI: a global community
## Forum, Workgroups

<table>
<thead>
<tr>
<th>Category</th>
<th>Latest</th>
<th>Topics</th>
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<tbody>
<tr>
<td><strong>General</strong></td>
<td>$#$ Welcome to OHDSI - Please introduce yourself $#$</td>
<td>8h</td>
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<tr>
<td></td>
<td>Where can I find OHDSI policies on human subjects issues? $#$ new</td>
<td>12h</td>
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<td>OHDSI Community Call 19 Jun 2018</td>
<td>1d</td>
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<td><strong>Implementers</strong></td>
<td>Corner ETL Workgroup $#$ new</td>
<td>4h</td>
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<td>Tracking Source References when loading Data from Separated by Systems 2d</td>
<td>1 / week</td>
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<td>Epic User Web, Epic ETL documentation/scripts $#$</td>
<td>19d</td>
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<td><strong>Developers</strong></td>
<td>$#$ Open Source Architecture Meeting Notes $#$ Jan 15</td>
<td>8 / month</td>
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<td></td>
<td>1K sample of simulated CMS SynPuf data in CDMV5 format available for download $#$</td>
<td>71 / year</td>
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<td>How to push Impala dbv5.3 fixed code $#$</td>
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<td><strong>Researchers</strong></td>
<td>Potential for Cancer/Oncology Studies in OHDSI—Need your thoughts! $#$</td>
<td>11h</td>
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<td>Building a validated OHDSI outcome library $#$</td>
<td>12h</td>
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<td>Treatment Pathways: Combination drugs (Posting 1) $#$</td>
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<td><strong>CDM Builders</strong></td>
<td>Multiple race solution? $#$</td>
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<td>Geographical/Year-Based Multiplier $#$</td>
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<td>Care sites and specialty specialty code clean-up $#$</td>
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<td><strong>Vocabulary Users</strong></td>
<td>The concepts in CONCEPT table is defined by OHDSI itself? $#$</td>
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<td>CPT4 Place of Service Codes $#$</td>
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<td>Sunscreen - Device or Drug $#$</td>
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<td><strong>Collaborators</strong></td>
<td>Sharing Research Results - Authentication Details $#$ Feb 15</td>
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ARACHNE Research Collaboration Network and Workflow Suite

ARACHNE研究协作网络和工作流程套件

Create study write up  Build a research team  Find relevant patient data  Perform data analysis  Create research paper  Publish into Insights Library

Study Notebook  Expert Finder  Clinical Data Catalog  Analysis Execution  Study Publisher  Insights Library

ARACHNE Approach

Insights & Decisions

Knowledge

Information

Data

Traditional approach

Effort = Cost
Summary 总结

• OHDSI is a public world-wide collaborative. Everybody can participate. It’s free. There is no catch.

• You don’t have to give the data away, but you need to standardize the data. The standard is strict. No shortcuts!

• When you do that, you get tools, methods, and a lot of new colleagues. People in the OHDSI community are nice and competent.

• You can do meaningful and scientifically high-quality network research.
Join the Journey

http://ohdsi.org