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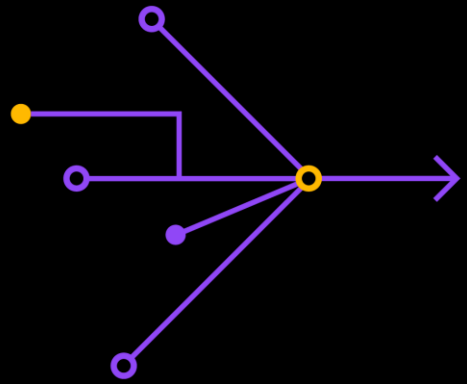
Healthier Data



Technical Masterclasses for hands on learning

Guy Tsafnat, PhD

Patrick Ryan, PhD

8 July 2023

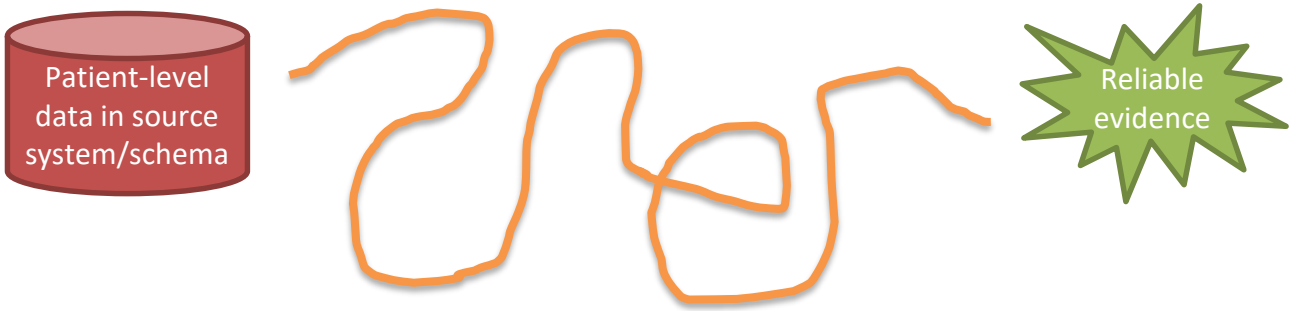
OHDSI Community in Action

Patrick Ryan, PhD

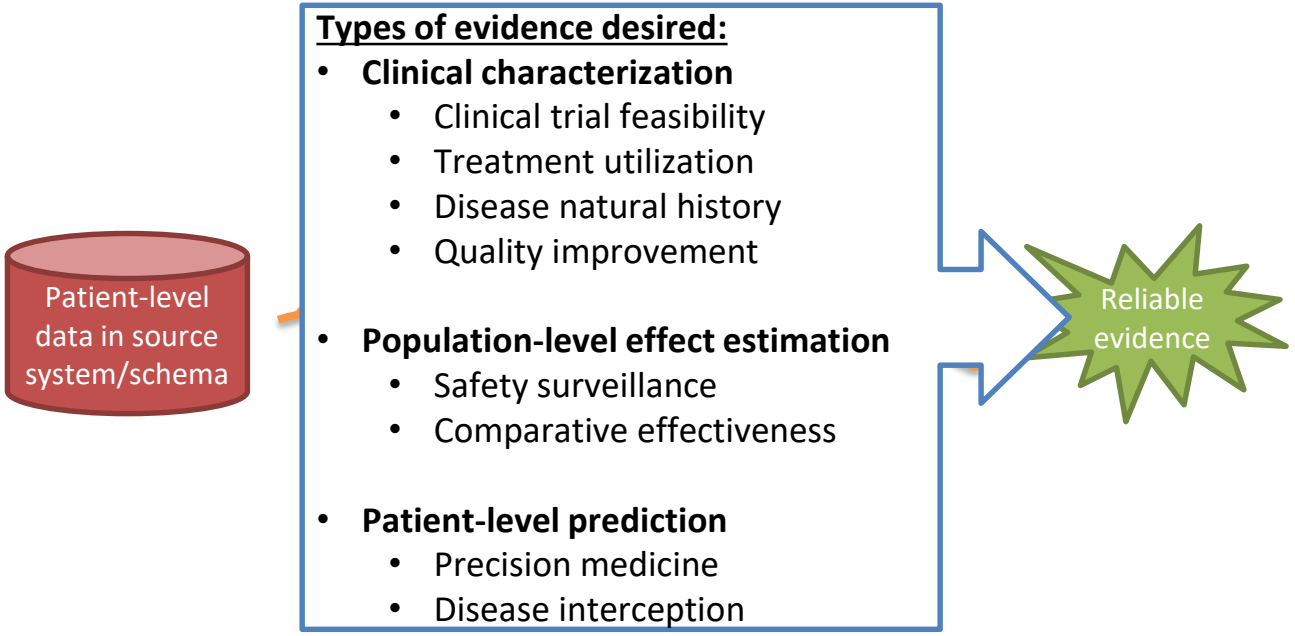
Vice President, Observational Health Data Analytics, Janssen Research and Development

Assistant Professor, Adjunct, Department of Biomedical Informatics, Columbia University Medical Center

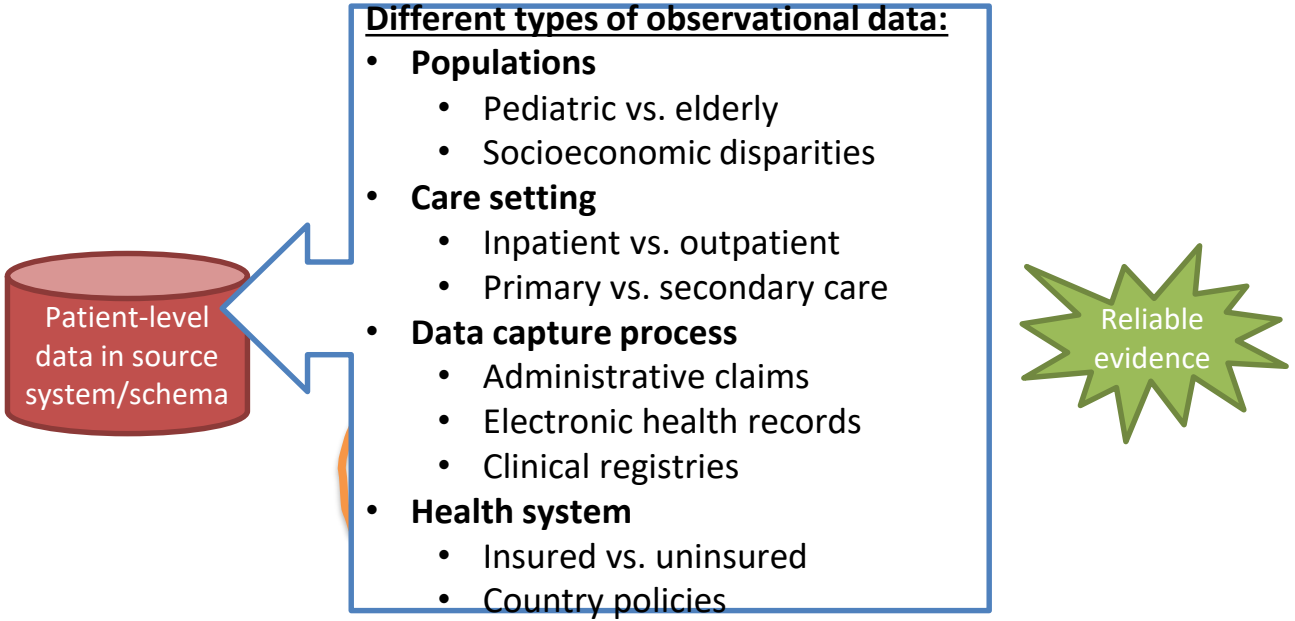
The journey to real-world evidence



The journey to real-world evidence



The journey to real-world evidence



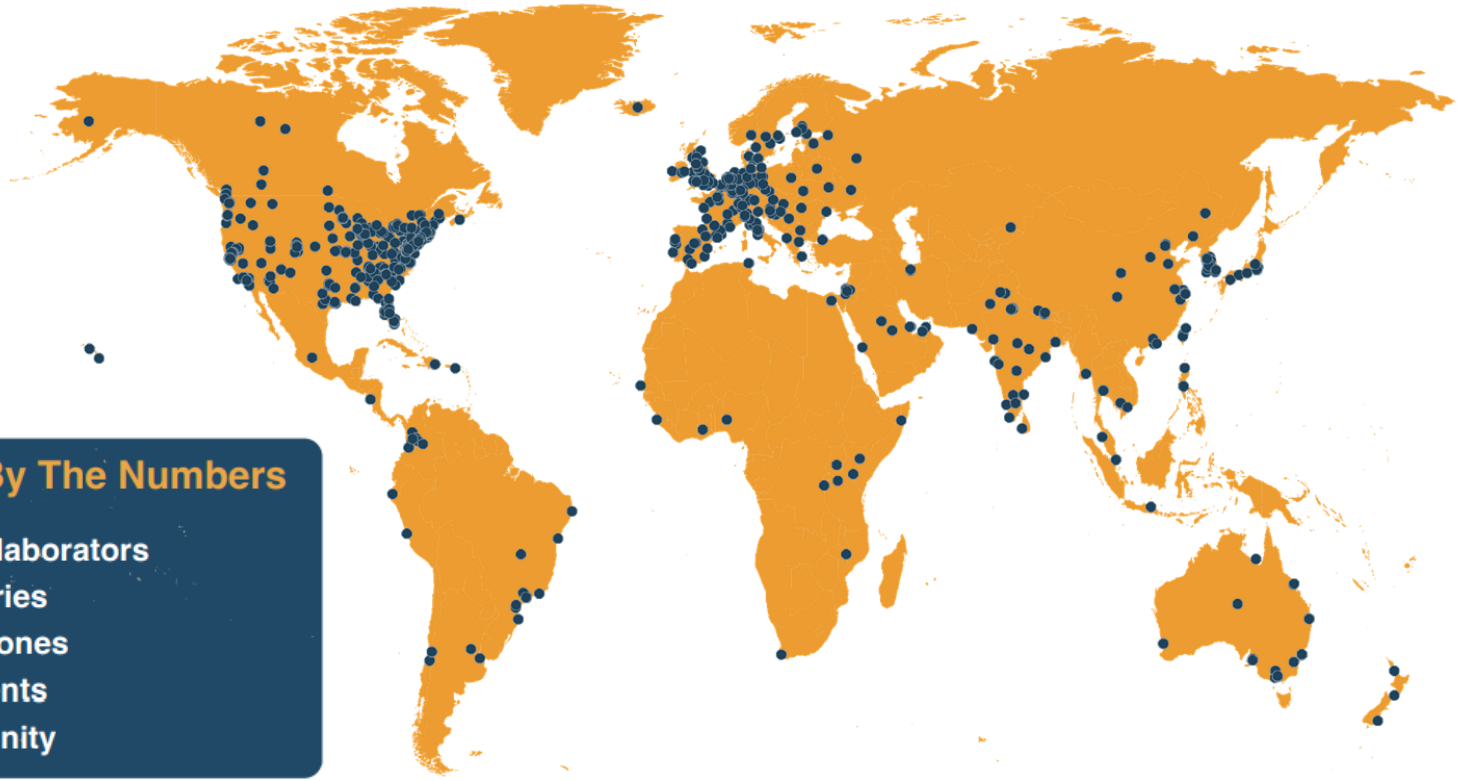
Desired attributes for reliable evidence

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

OHDSI's mission

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

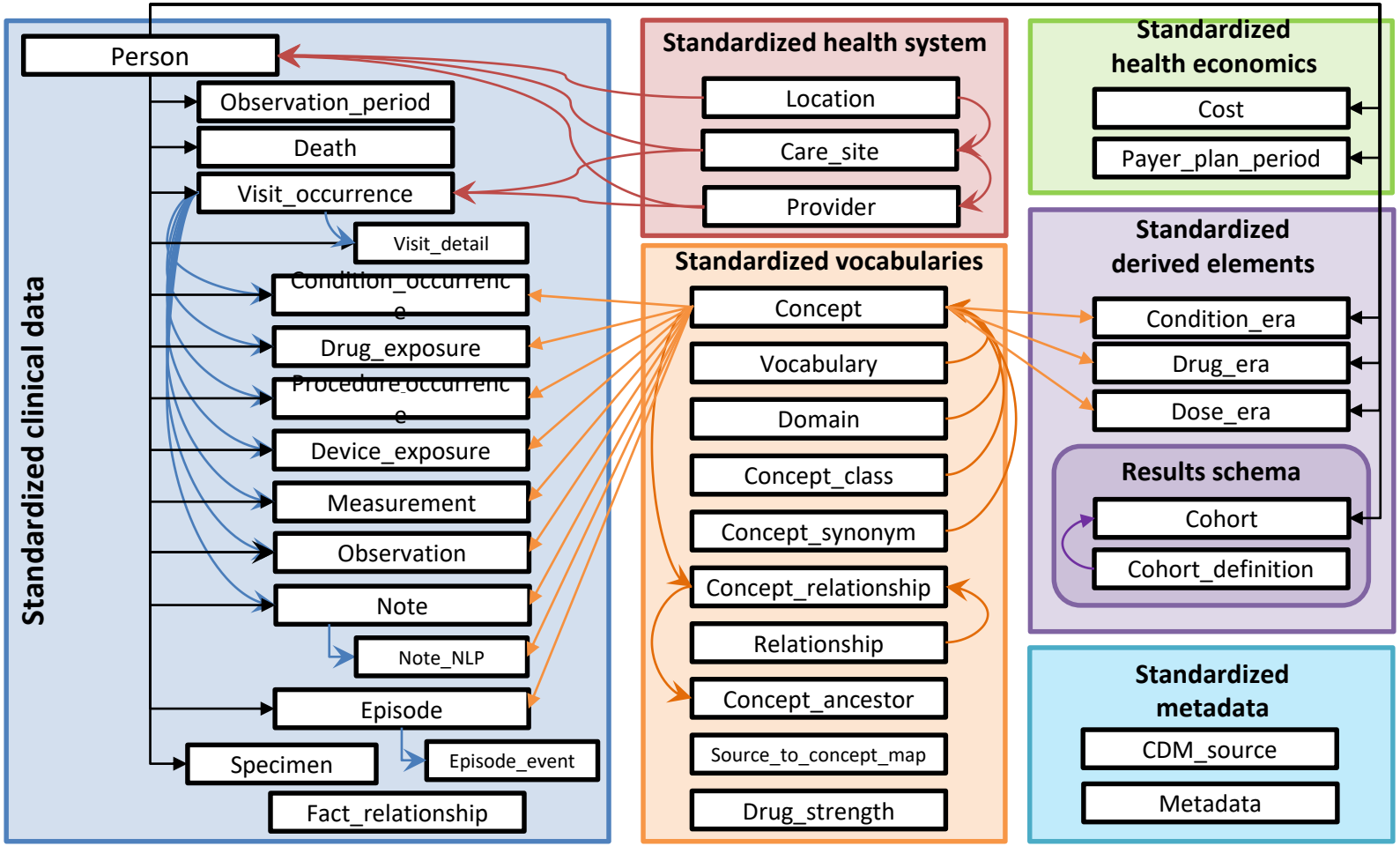
Map of collaborators



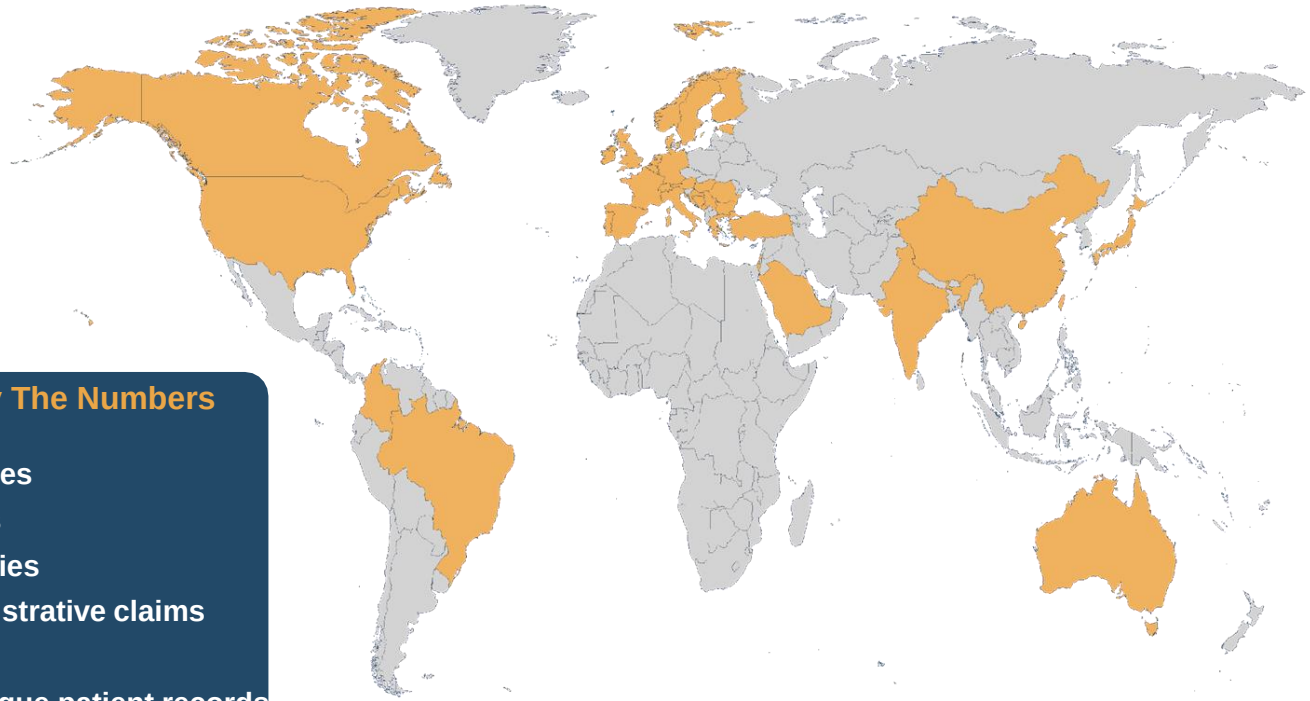
OHDSI By The Numbers

- 3,266 collaborators
- 80 countries
- 21 time zones
- 6 continents
- 1 community

OMOP Common Data Model v5.4



OHDSI data partners

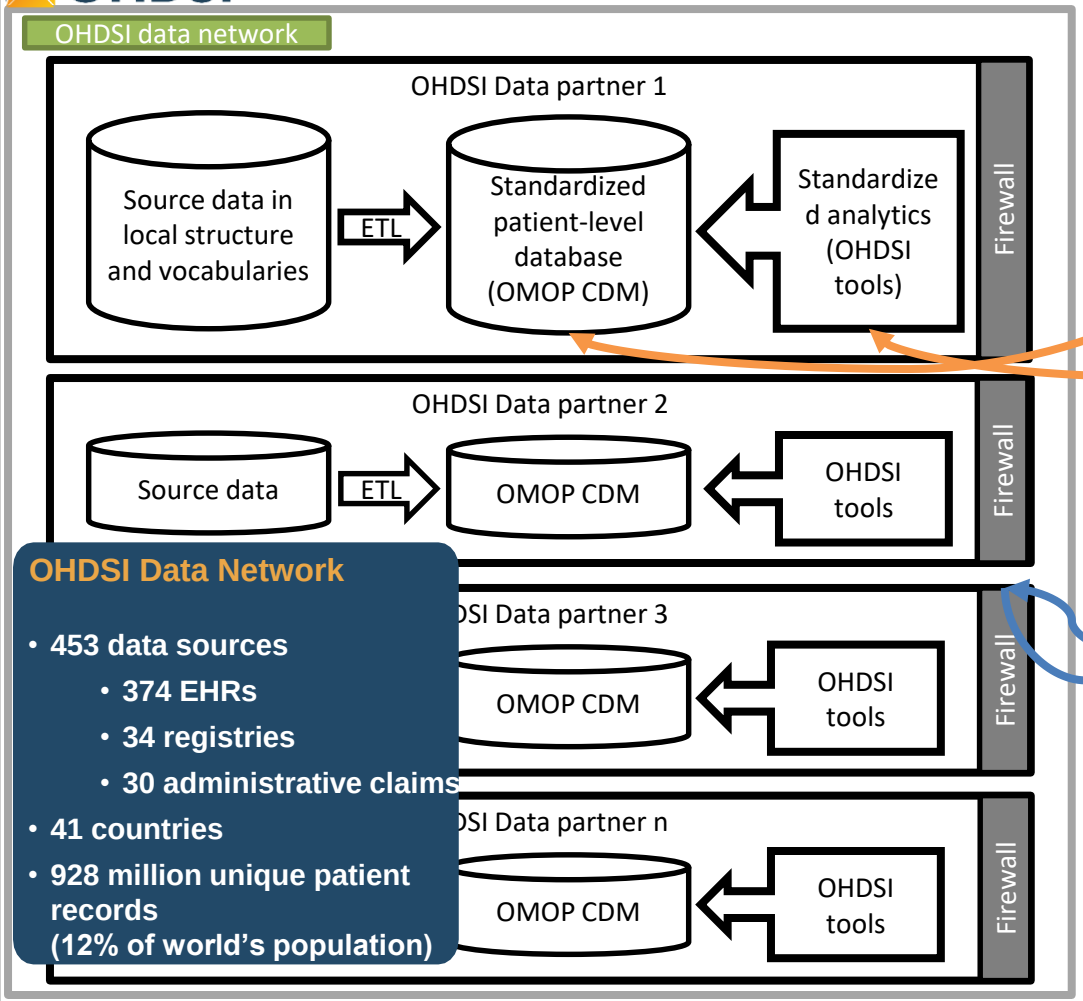


OHDSI Data By The Numbers

- 453 data sources
  - 374 EHRs
  - 34 registries
  - 30 administrative claims
- 41 countries
- 928 million unique patient records (12% of world's population)

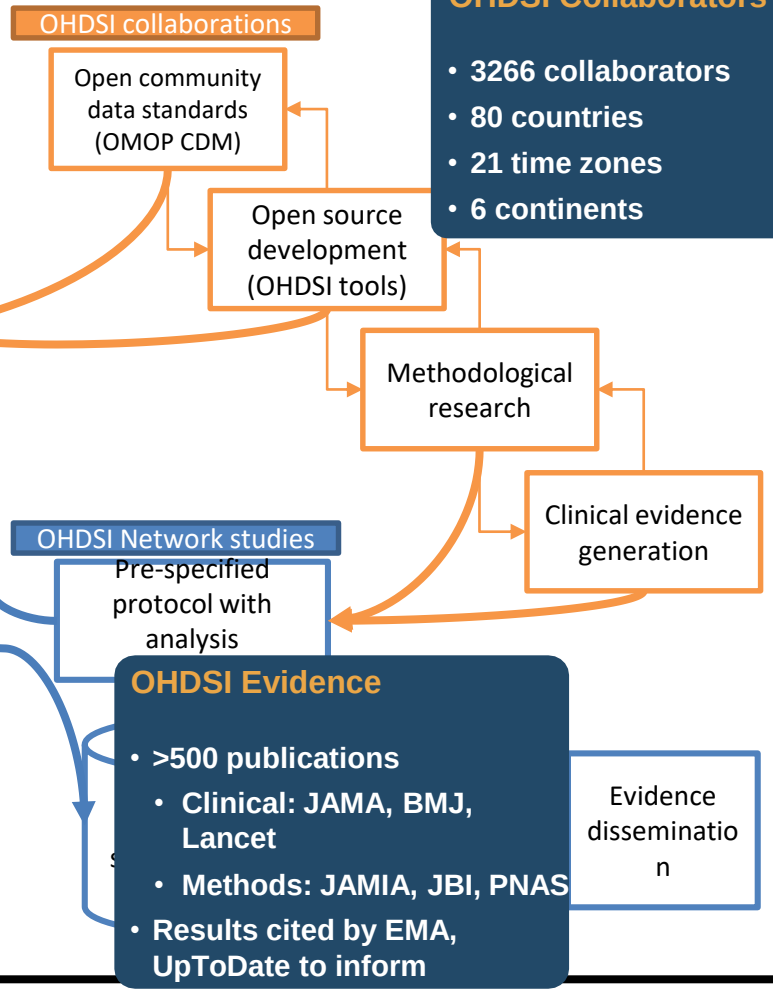
OHDSI

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



OHDSI Data Network

- 453 data sources
  - 374 EHRs
  - 34 registries
  - 30 administrative claims
- 41 countries
- 928 million unique patient records (12% of world's population)



OHDSI Collaborators

- 3266 collaborators
- 80 countries
- 21 time zones
- 6 continents

OHDSI Evidence

- >500 publications
  - Clinical: JAMA, BMJ, Lancet
  - Methods: JAMIA, JBI, PNAS
- Results cited by EMA, UpToDate to inform

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Making real world data actionable with OMOP

Technical Masterclasses for hands on learning

guyt@evidentli.com

8 July 2023

From sources to OMOP

OMOP lets us get insights from data. But getting there …

Ingestion

Time to Value

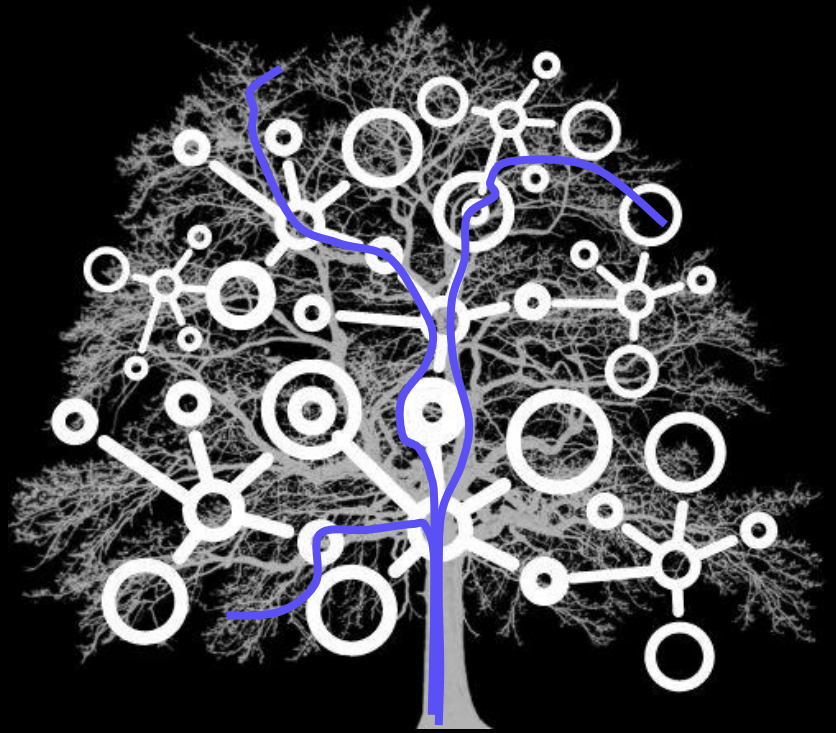
Data Quality

Scarce Skills

From sources to OMOP

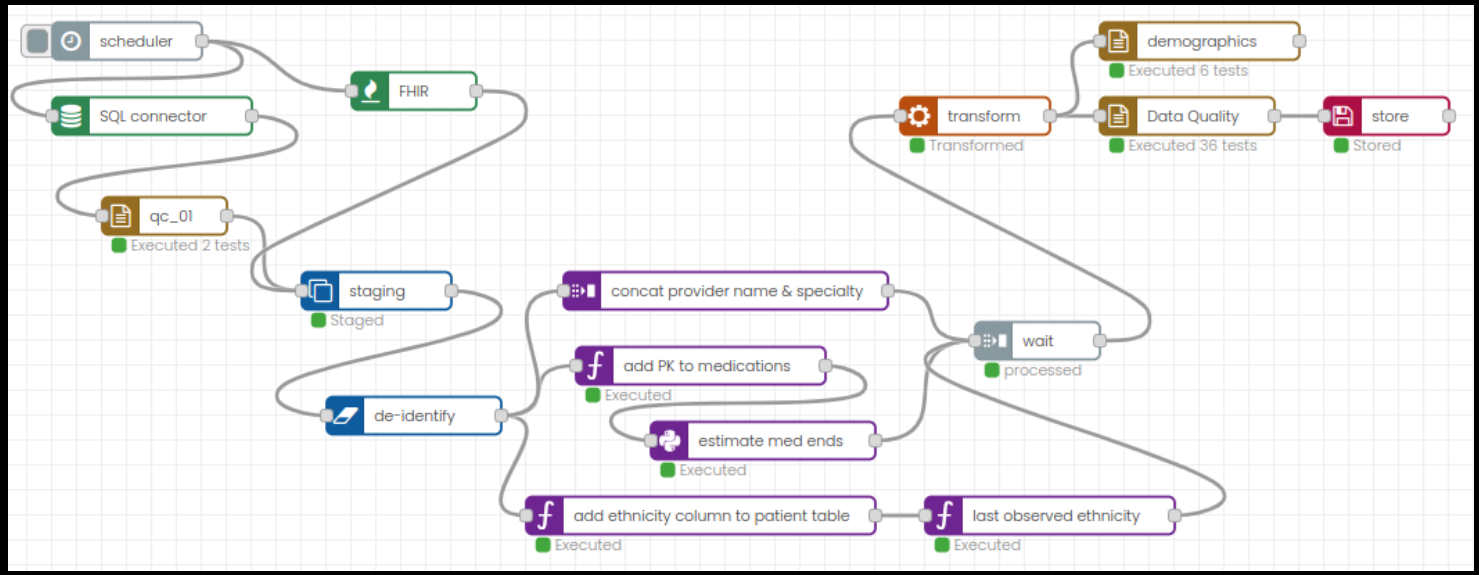
Ingestion

- Multiple facilities
- 8-30 databases per hospital
- Many vendors
- Hyper customized
- Variation in training
- Variation in population
- Variation in settings
- Cultural variation



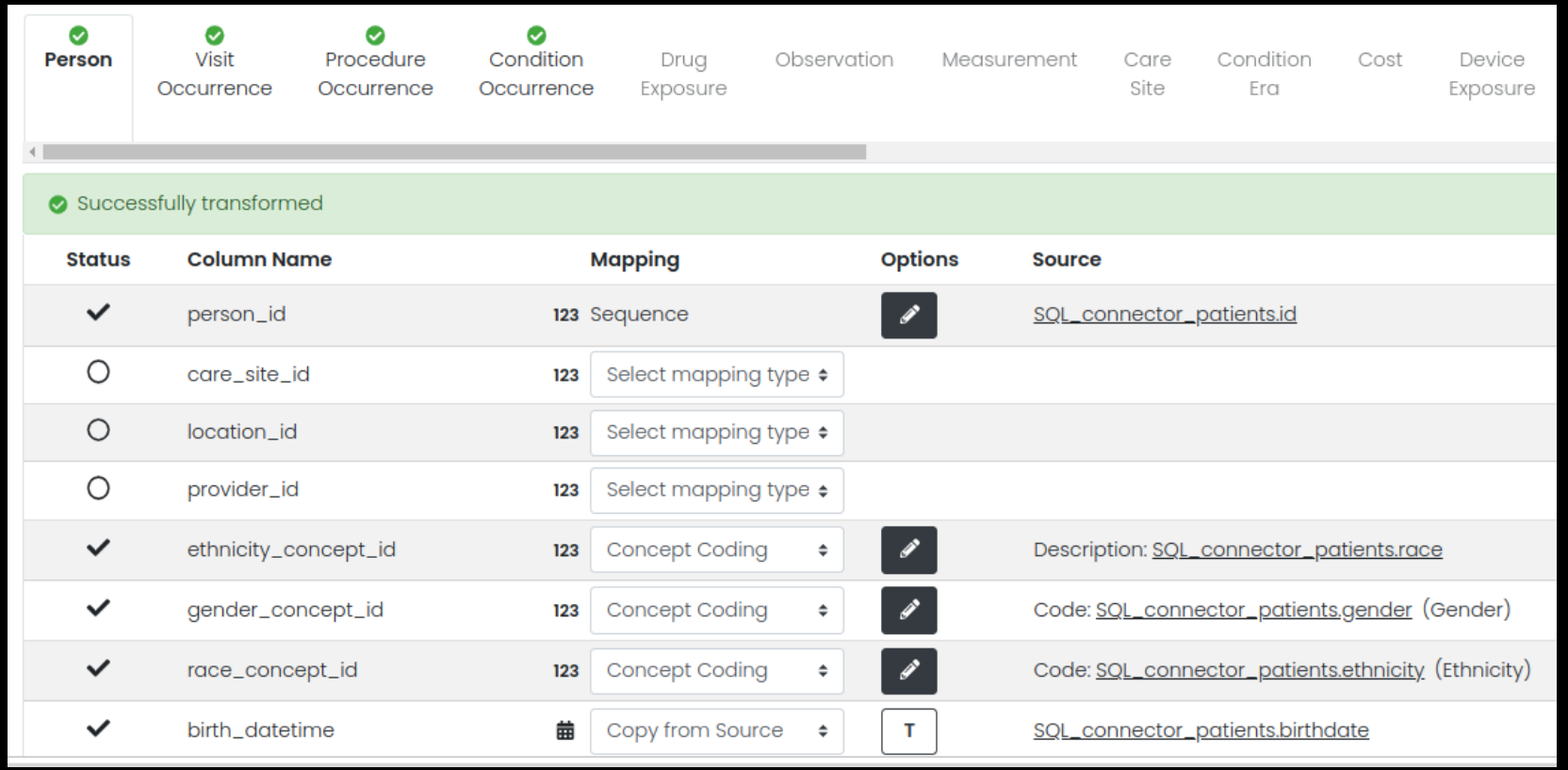
From sources to OMOP

Ingestion



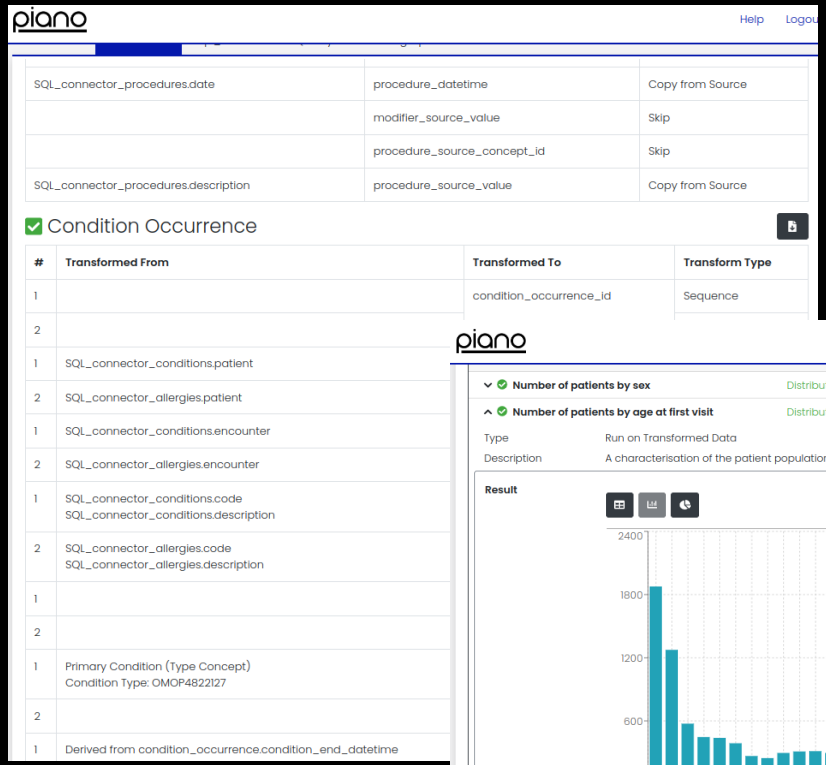
From sources to OMOP

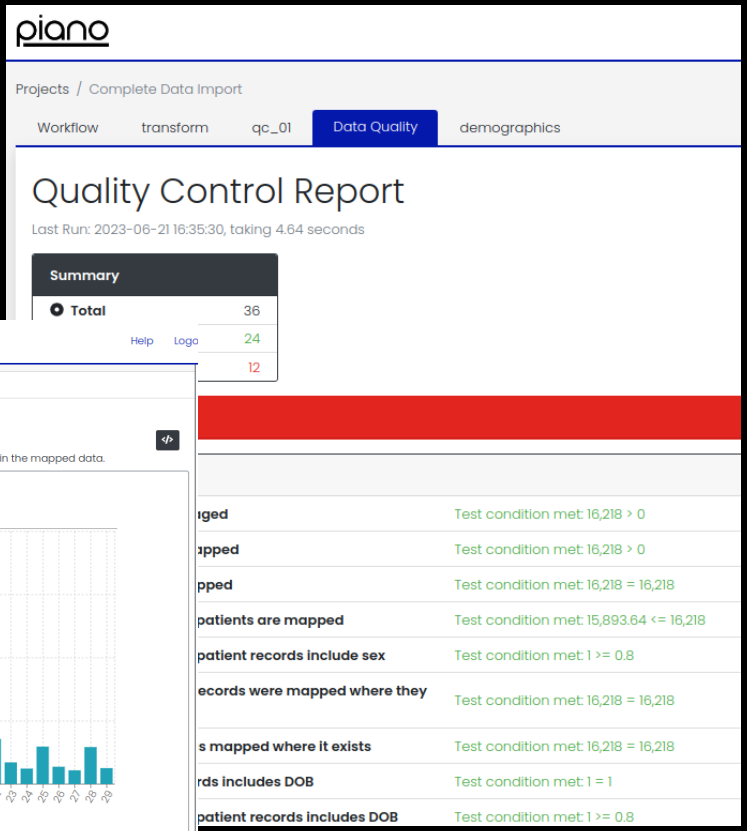
Ingestion



Provenance, data quality and demographics

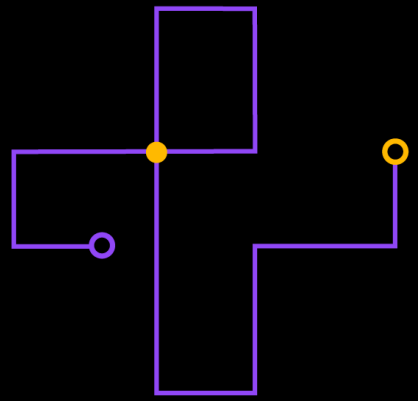
Ingestion





Precision is speed, speed is critical.

- Bespoke AI developed since 2010
- 6 to 20 X more precise than data analysts
- Hundreds of AI's generated on the fly,
  - Each specific to a specific data segment
  - No pre-training
  - Active learning
- Faster time to insight → more value



Act quickly, before FCAMV becomes a pandemic!

Data governance - purpose

Governance

General
Data Sets
Members
Log

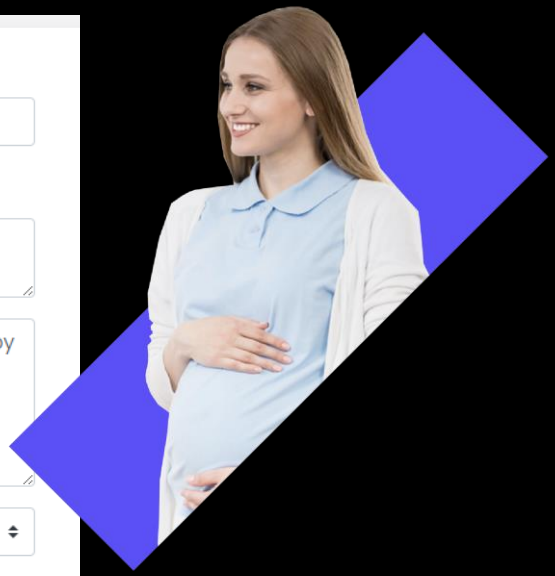
Name: FCAMV prevalence

Owner: Guy Tsafnat

Abstract (optional):

Description (optional): An analysis of the prevalence of FCAMV cases broken down by hospital department and patient demographics.
Statistics calculated in this analysis are fed directly to the emergency FCAMV dashboard.

API Access: Access aggregate data only



Data governance - restrictions

Governance

Data Set 1

Ethics Agent	Macquarie HREC	
Ethics Approval No.	N-002846/H	
Data Set Name	M	
Data Set Version		☑ Always use latest Database Version
Access Expiry Date	08/07/2025	
Re-Identification Permissions	☐ Re-Identify Everything ☐ Re-Identify Dates	
Table Permissions	No tables found	
Person Minimum	10	

Data governance - selection

Governance

Table Permissions
select all

Clinical Data Tables

☑ Person	☑ Observation Period	☑ Visit Occurrence
☑ Visit Detail	☑ Condition Occurrence	☑ Drug Exposure
☐ Procedure Occurrence	☐ Device Exposure	☑ Measurement
☑ Observation	☑ Note	☐ Note Nlp
☑ Specimen	☑ Fact Relationship	☐ Survey Conduct

Health System Data Tables

☑ Location	☑ Location History	☑ Care Site
☑ Provider		

Health Economics Data Tables

☐ Payer Plan Period	☐ Cost

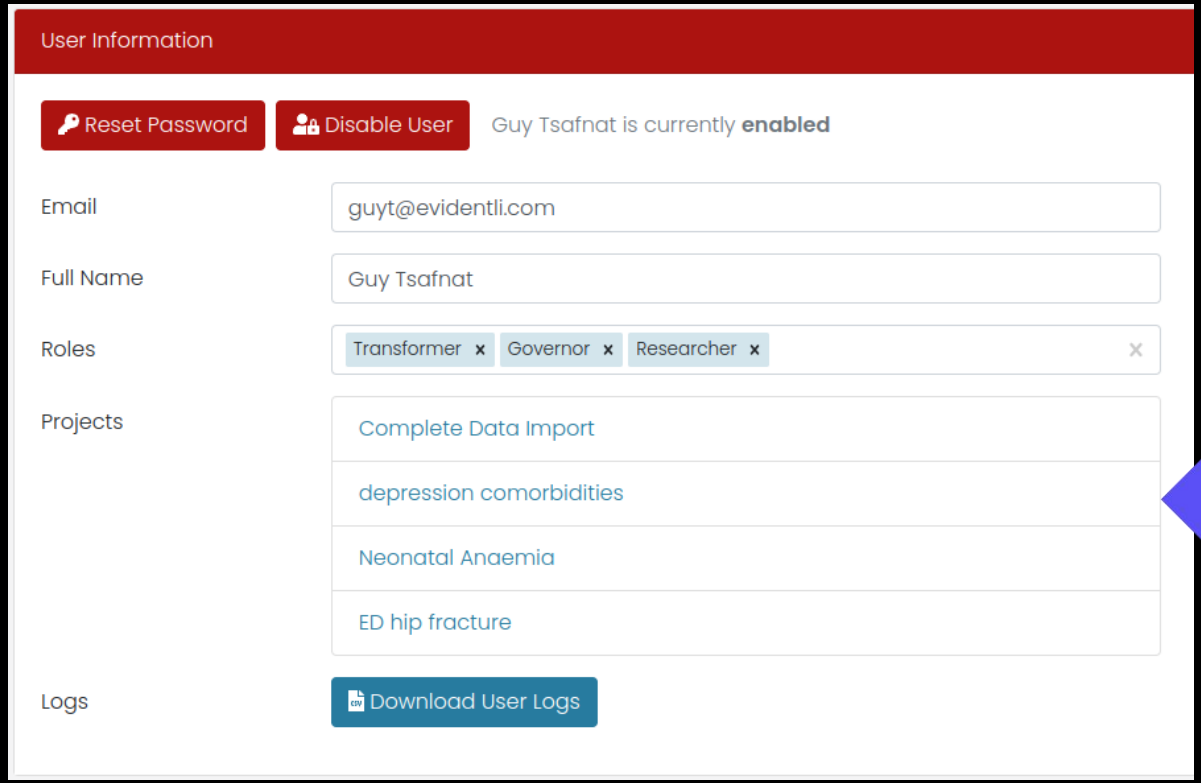
Standardized Derived Elements

☑ Drug Era	☑ Dose Era	☑ Condition Era

Vocabulary Tables

☑ Concept	☑ Vocabulary	☑ Domain
☑ Concept Class	☑ Concept Relationship	☑ Relationship
☑ Concept Synonym	☑ Concept Ancestor	☑ Source To Concept Map
☑ Drug Strength	☑ Cohort	☑ Cohort Definition

Data governance - roles and memberships



Governance

Clinical Analytics

- Who asked the question
  - Did the analyst understand the question?
  - Did the analyst translate the question correctly into code?
  - Did the analyst interpreted the results correctly?
  - Can you verify the analyst's work?
  - Can you trust the results?
- How long did this take?

Clinical Analytics

Patient

Age at visit between: 65 and e.g. 2y 3m 1w 4d

Sex: Search for sex

Ethnicity: Search for ethnicity

Visit / Admission

Visit occurred between: e.g. 2019/12/31 and e.g. NOW - 6m

Length of visit ranged from: e.g. 2 to e.g. 7 days

Type: ER Emergency Room Visit (Visit) x | ERIP Emergency Room and Inpatient Visit (Visit) x

☐ Only consider completed visits

Condition(s)

Include the following conditions

{hip fractures} x

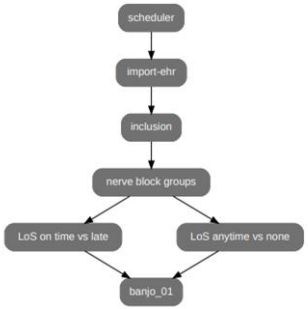
Dissemination

Compliance with ED hip fracture guidelines and downstream effects - an automated audit

Introduction

Elederly patients presenting with unilateral or bilateral hip fractures should receive a local anaesthetic with an hour of their visit. The primary purpose of this audit is to measure compliance with this guidelines. We further measure the effect of not providing analgesic treatment within the first hour on patient satisfaction, patient reported pain scores throughout their stay, as well as the length of stay.

Methods



Data Set inserted patient information from the vDEMO_b3933010-fc9b-4593-8b2a-fb841cec40cf_00 data set into the workflow. The Solo node "inclusion" assigned to the cohort "inclusion" all persons who are aged 65 and over, and with visit(s) with visit type emergency room visit or emergency room and inpatient visit, and with the condition hip fractures. For more information see Appendix 1. The Concerto node "nerve block groups" assigned patients to the cohorts "nerve block anytime", " no nerve block ", "nerve block more than 1 hr" and "nerve block within 1 hr". The cohort " no nerve block " includes all persons who were involved in 2 events, with Event 1 occurring before Event 2. Event 1 matches all persons with completed visit(s), and Event 2 matches all persons who did not undergo the procedure hip nerve blocks. The cohort "nerve block anytime" includes all persons who were involved in 2 events, with Event 1 occurring before Event 2. Event 1 matches all persons with completed visit(s), and Event 2 matches all persons who underwent the procedure hip nerve blocks. The cohort "nerve block more than 1 hr" includes all persons who were involved in 2 events, with Event 1 occurring more than 1 hour before Event 2. Event 1 matches all persons with completed visit(s), and Event 2 matches all persons who underwent the procedure hip nerve blocks. The cohort "nerve block within 1 hr" includes all persons who were involved in 2 events, with Event 1 occurring less than 1 hour before Event 2. Event 1 matches all persons with completed visit(s), and with the condition hip fractures, and Event 2 matches all persons who underwent the procedure hip nerve blocks. For more information see Appendix 2.

The Kimono node "LoS anytime vs none" calculated the Difference of Means of "visit_occurrence.length_of_stay" for cohorts "nerve block anytime" and "no nerve block".

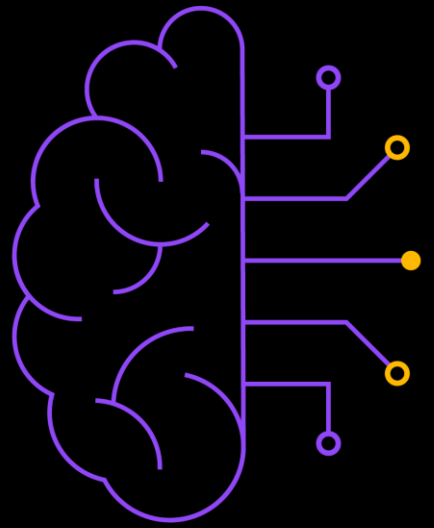
The Kimono node "LoS on time vs late" calculated the Difference of Means of "visit_occurrence.length_of_stay" for cohorts "nerve block within 1 hr" and "nerve block after more than 1 hr".

This report was generated at 10:37 AM on Thursday 29 Jun 2023. See Appendix 3 for more information.

The project workflow was started manually.

Results

Providing a nerve block more than an hour after admission, shortens the length of stay of patients with neck of femur fractures None days on average. Not providing

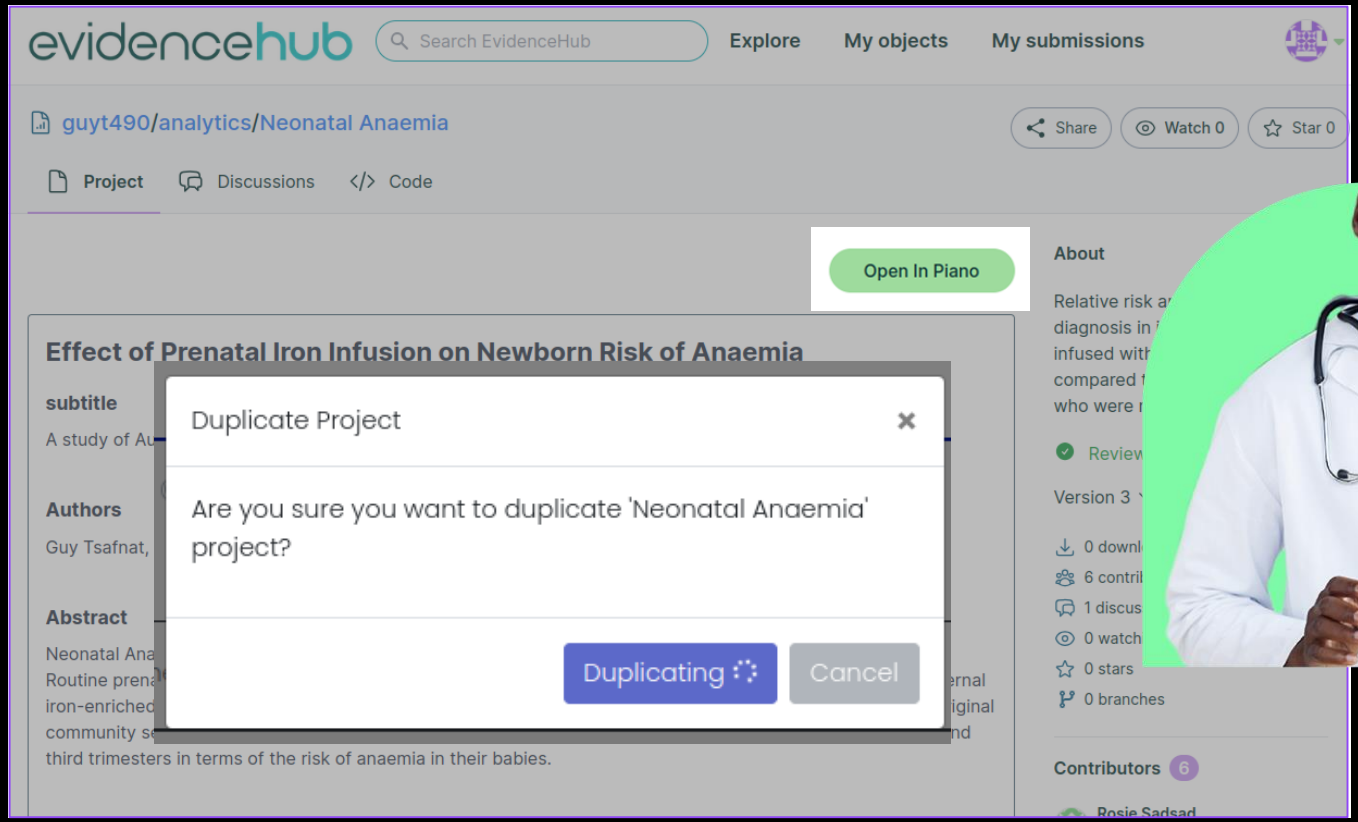


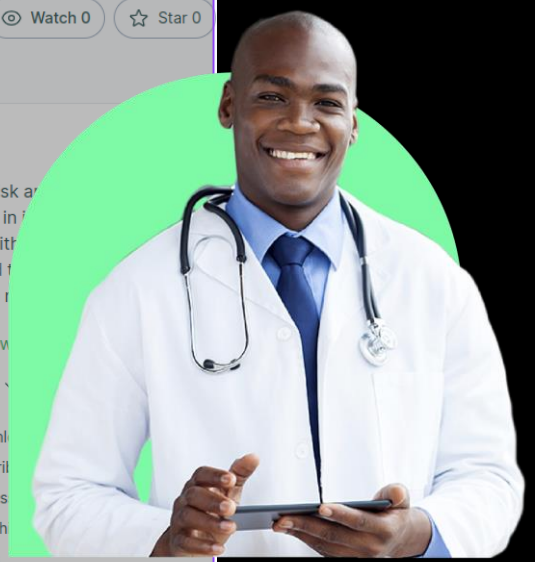
Evidence

Collaboration - reproducibility

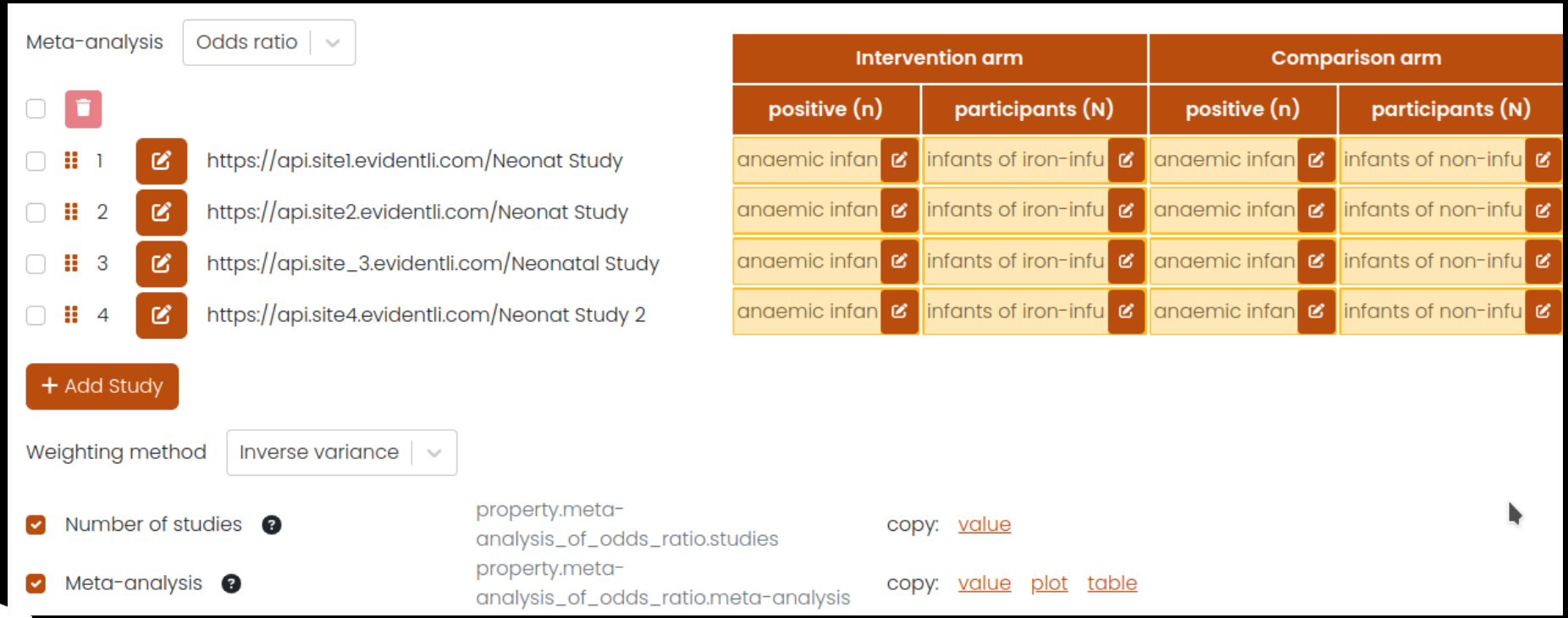
Evidence

Collaboration





Collaboration - federation



Collaboration - federation

#	Study	Intervention (n/N)	Control (n/N)	Odds Ratio [95% CI]	Weight	Odds Ratio [95% CI]
1	Neonat Study	5224/8238	5158/7980		37.2%	0.95 [0.89, 1.01]
2	Neonat Study 2	995/2583	988/2502		12.1%	0.96 [0.86, 1.07]
3	Neonat Study 3	3243/8238	3182/7980		38.7%	0.98 [0.92, 1.04]
4	Neonat Study 2	995/2583	988/2502		12.1%	0.96 [0.86, 1.07]
	Total	**21642**	**20964**		**100.0%**	**0.96 [0.93, 1.00]**

Total events: 10457 (Intervention), 10316 (Control)
Heterogeneity: $I^2 = 0.0\%$

Evidence

Get involved with OMOP + FHIR

- **OHDSI APAC Symposium**: July 13-14, University of New South Wales
  - OMOP/FHIR: challenges of each model and how the collaboration can resolve those challenges. Grahame Grieve, FHIR Product Director
    - www.ohdsi.org/2023apacsymposium/
- **OHDSI Weekly Community Call**: each Tuesday, 11 am EASTERN, US
  - July 18, Vulcan: An HL7 FHIR Accelerator Transforming Clinical & Translational Research
    - https://ohdsi.org/community-calls/
- **OHDSI Global Symposium**: Oct. 20-22, East Brunswick, New Jersey,
  - OMOP + FHIR Connectathon: 8a-5p, Sunday, October 22
    - https://ohdsi.org/ohdsi2023/
- **OHDSI OMOP + FHIR Working Group Main Calls**
  - Mondays (weekly) 6-7 pm EASTERN US (via MS Teams)
    - https://www.ohdsi.org/upcoming-working-group-calls/

Contact: tsafnat@ohdsi.org

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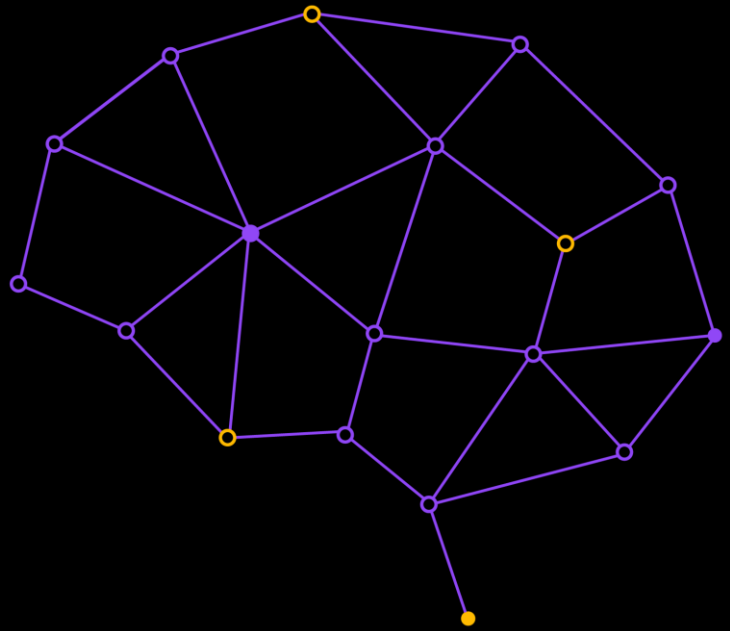

Get in touch

Exhibition hall, booth #77

guyt@evidentli.com

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