



FHIR Analytics using OHDSI Tools on Cloud

Vivian Neilley, Google Cloud



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Who am I?

- Vivian Neilley
- Solutions Consultant
- Google Cloud



Presentation

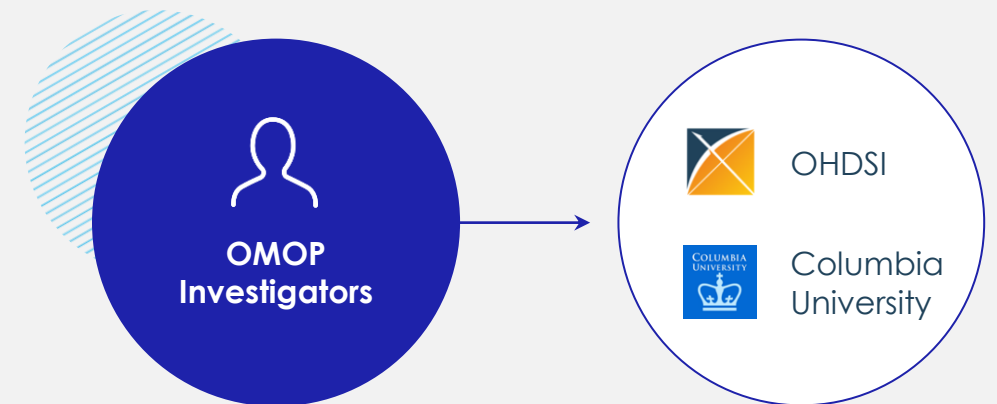
- Open-source reference implementation to convert healthcare data in FHIR format into the OMOP CDM
- How to analyze the data using OHDSI tooling
Secondly, we will demonstrate how standard tools like ATLAS can use Google BigQuery for scalable analytics on the cloud.

OHDSI

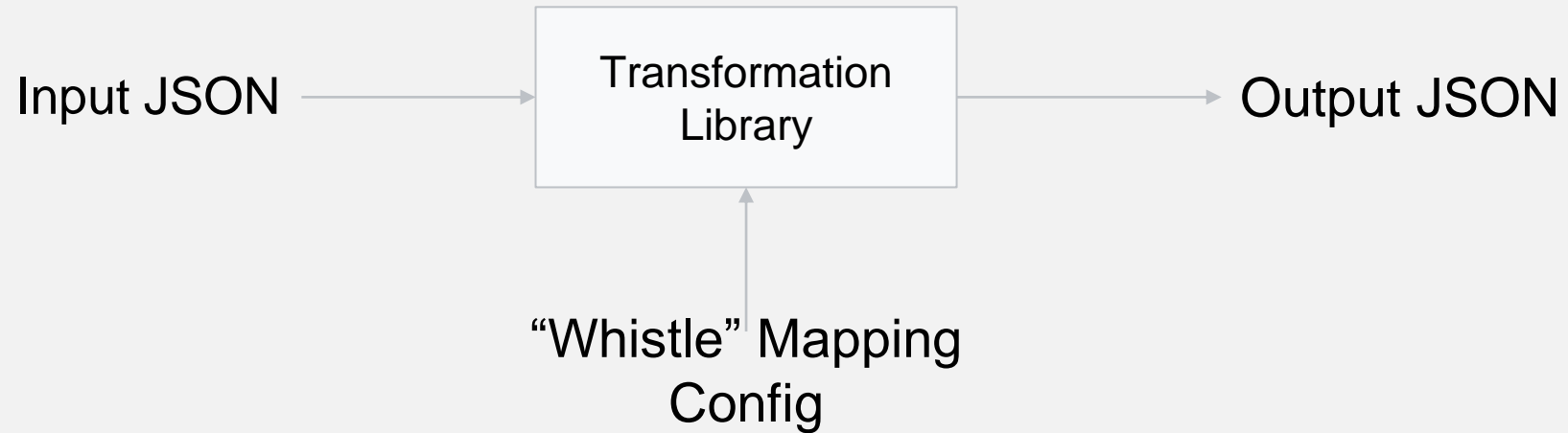
The Observational Health Data Sciences and Informatics (OHDSI) program is a **multi-stakeholder, interdisciplinary collaborative** to create **open-source** solutions that bring out the value of observational health data through large-scale analytics

OHDSI has established **an international network of researchers and observational health databases** with a central coordinating center housed at Columbia University

- Public, Open
- International



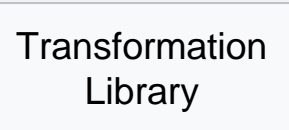
Transformation Architecture



“Whistle” is the name of core [mapping config language](#); the associated [transformation library](#) is implemented in Go.

Transformation Library

```
{
  "segmentId": "XAD",
  "fields": {
    "1": "51 Breithaupt St",
    "2": "Google",
    "3": "Kitchener",
    "4": "ON",
    "5": "N2H5G5",
    "6": "Canada",
    "7": "Work",
    "8": "Other geographic
designation",
    "9": "100"
  }
}
```

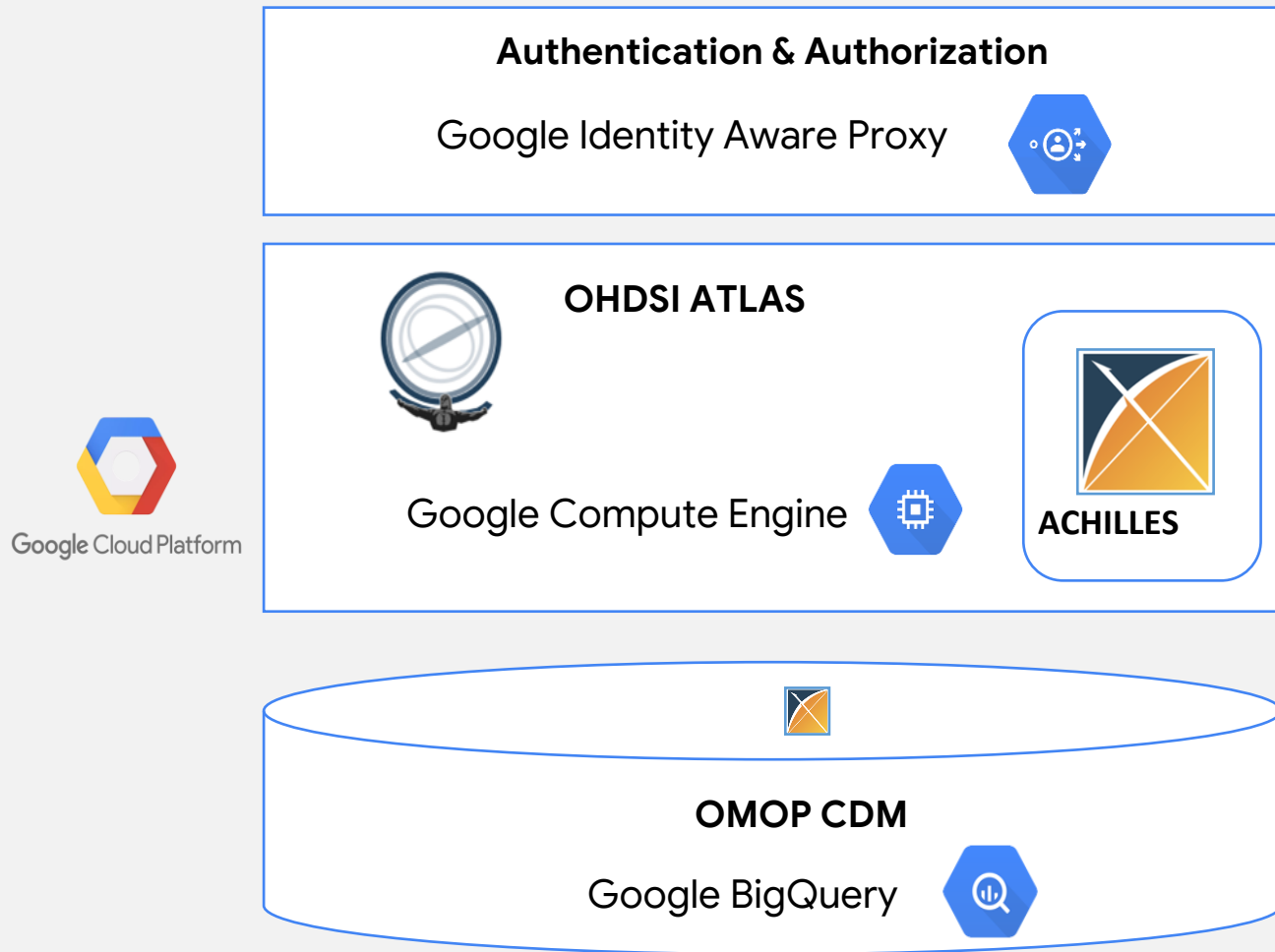


```
use: XAD.7
text: " ", XAD.1, XAD.2,
      XAD.3, XAD.4, XAD.5, XAD.6
      => _StrJoin
line: XAD.1 => _ListOf
city: XAD.3
district: XAD.9
state: XAD.4
postCode: XAD.5
country: XAD.6
type: "physical"

Whistle Mapping Config
```

```
{
  "use": "Work",
  "text": "51 Breithaupt St Google
Kitchener ON N2H5G5 Canada",
  "line": [
    "51 Breithaupt St Google"
  ],
  "city": "Kitchener",
  "district": 100,
  "state": "ON",
  "postalCode": "N2H5G5",
  "country": "Canada",
  "type": "physical"
}
```

OMOP & ATLAS on BigQuery



Single sign-on (SSO)

OHDSI ATLAS

- Vocabulary search
- Database level statistics (Achilles)
- Patient profile
- Cohort definitions
- Incidence Rate Analysis tool
- Population-level Estimation
- Patient-level Prediction
- TxPathways

ACHILLES

OMOP CDM characterization statistics

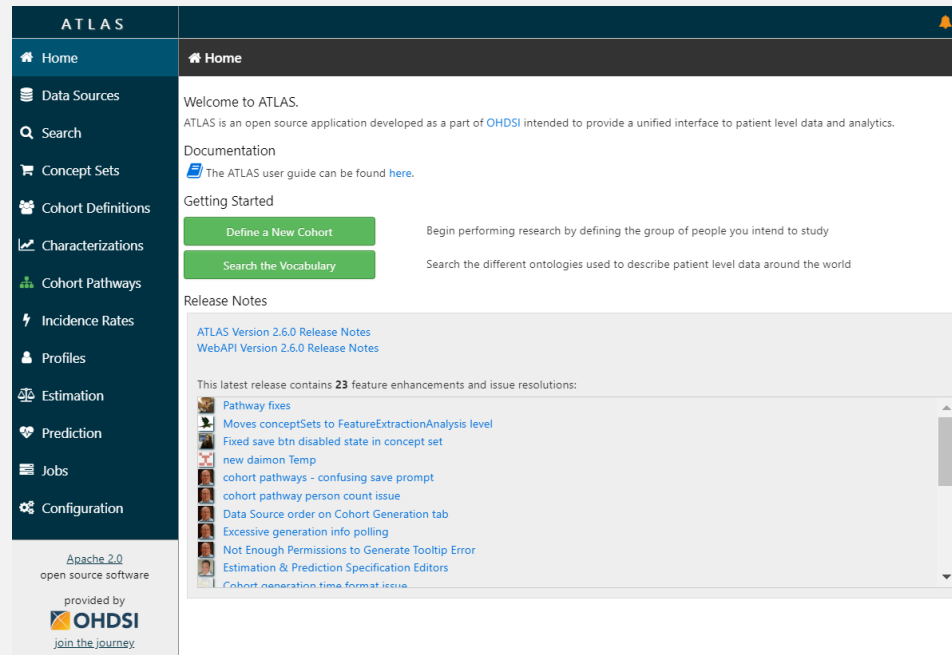
OMOP CDM database

OHDSI ATLAS

OHDSI ATLAS is intended to provide a unified interface to standardized patient-level data converted to the OMOP Common Data Model (CDM) and to conducting observational research on them.

Its GUI allows researchers to define patient cohorts, select analytical designs, set parameters and execute analytical methods against data.

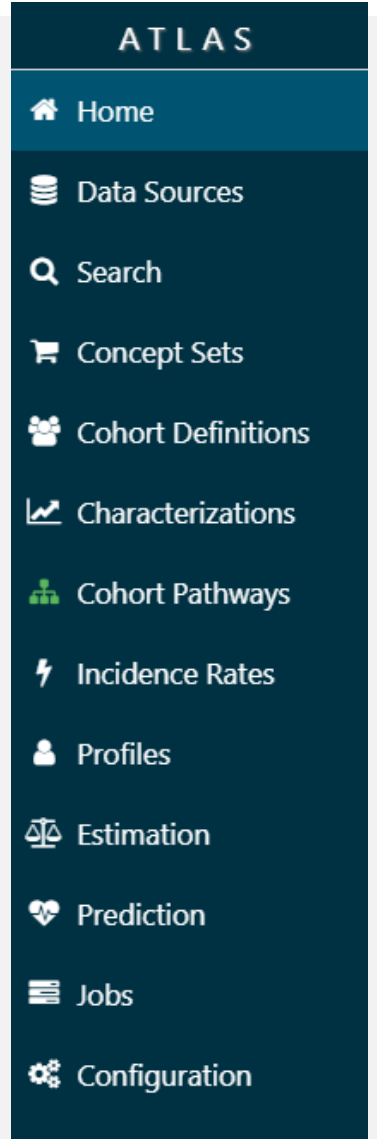
Odysseus offers Enterprise engineering and support services to allow commercial organizations to utilize OHDSI ATLAS in Enterprise implementations



The screenshot shows the ATLAS web application interface. On the left is a dark blue navigation sidebar with the following menu items: Home, Data Sources, Search, Concept Sets, Cohort Definitions, Characterizations, Cohort Pathways, Incidence Rates, Profiles, Estimation, Prediction, Jobs, and Configuration. The main content area is titled 'Home' and contains the following sections:

- Welcome to ATLAS.** ATLAS is an open source application developed as a part of OHDSI intended to provide a unified interface to patient level data and analytics.
- Documentation**
 - The ATLAS user guide can be found [here](#).
- Getting Started**
 - Define a New Cohort** (green button): Begin performing research by defining the group of people you intend to study
 - Search the Vocabulary** (green button): Search the different ontologies used to describe patient level data around the world
- Release Notes**
 - ATLAS Version 2.6.0 Release Notes
 - WebAPI Version 2.6.0 Release Notes
 - This latest release contains **23** feature enhancements and issue resolutions:
 - Pathway fixes
 - Moves conceptSets to FeatureExtractionAnalysis level
 - Fixed save btn disabled state in concept set
 - new daimon Temp
 - cohort pathways - confusing save prompt
 - cohort pathway person count issue
 - Data Source order on Cohort Generation tab
 - Excessive generation info polling
 - Not Enough Permissions to Generate Tooltip Error
 - Estimation & Prediction Specification Editors
 - Cohort generation time format issue

At the bottom left of the main content area, there is a logo for Apache 2.0 open source software, provided by OHDSI, with the tagline 'join the journey'.



A vertical navigation menu for ATLAS with a dark blue background and white text. The menu items are:

- Home
- Data Sources
- Search
- Concept Sets
- Cohort Definitions
- Characterizations
- Cohort Pathways
- Incidence Rates
- Profiles
- Estimation
- Prediction
- Jobs
- Configuration

- Home
- Data Sources
- Vocabulary
- Concept Sets
- Cohorts
- Incidence Rates
- Profiles
- Estimation
- Prediction
- Jobs
- Configuration
- Feedback

Data Source Profiles

OHDSI CDM V5 Database

Drug

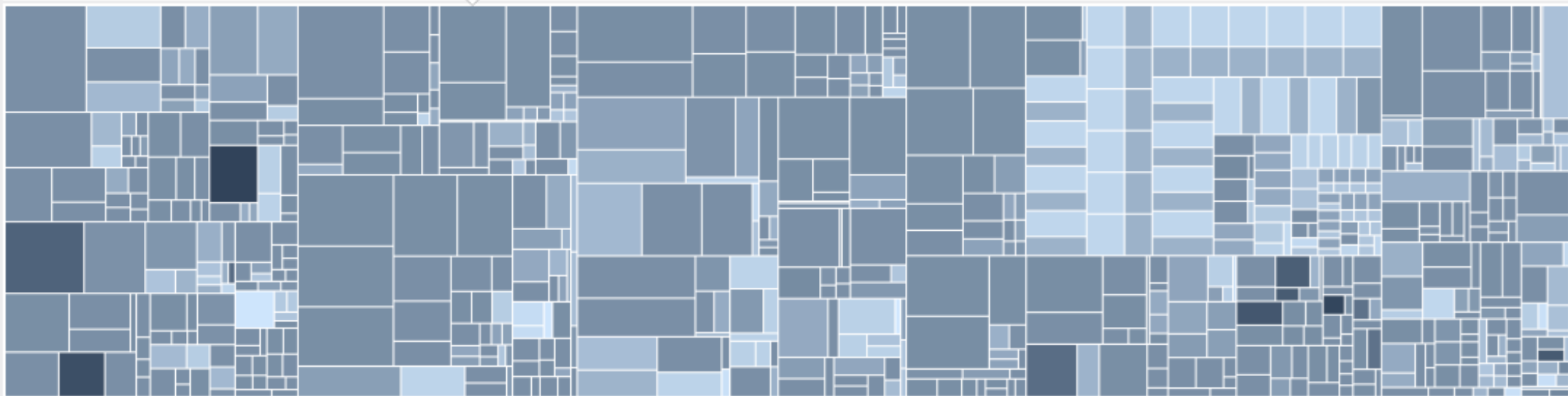
Drug Report (OHDSI-C

Prevalence

Treemap Table

BLOOD AND BLOOD FORMING ORGANS
BLOOD SUBSTITUTES AND PERFUSION SOLUTIONS
Electrolyte solutions
Magnesium Sulfate

50 ML Magnesium Sulfate 40 MG/ML Injection
Prevalence: 34.11%
Number of People: 15,869
Records per person: 3.50



Box Size: Prevalence, Color: Records per person (Light to Dark = Low to High), Use Ctrl-Click to Zoom, Alt-Click to Reset Zoom

Drilldown Report: 50 ML Magnesium Sulfate 40 MG/ML Injection

Prevalence



Contact

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Q&A