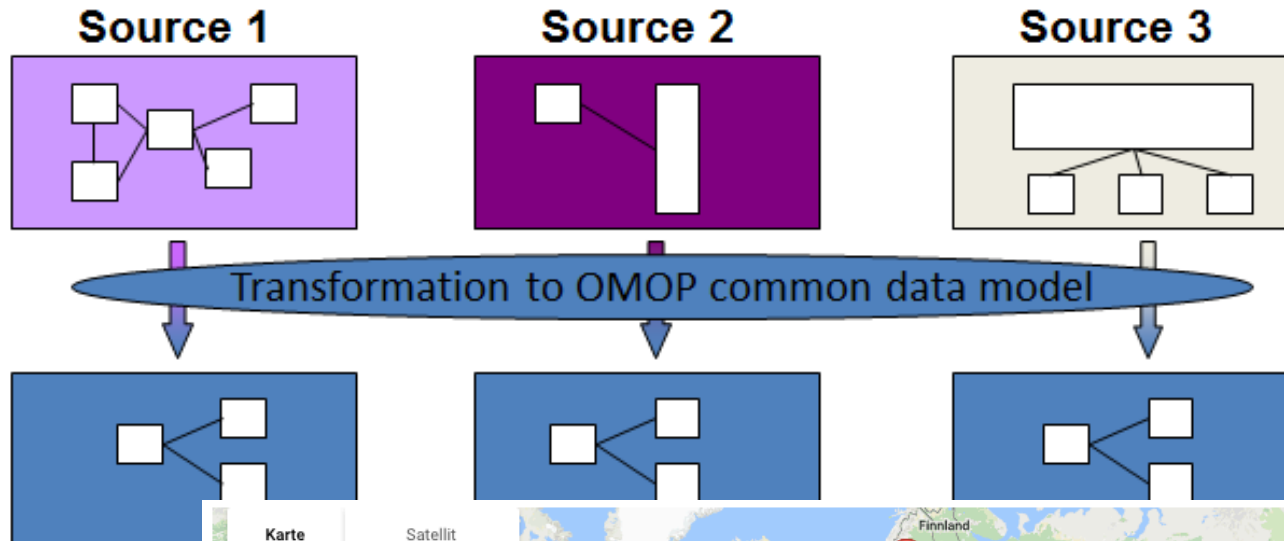


Observational Medical Outcomes Partnership (OMOP) Common Data Model

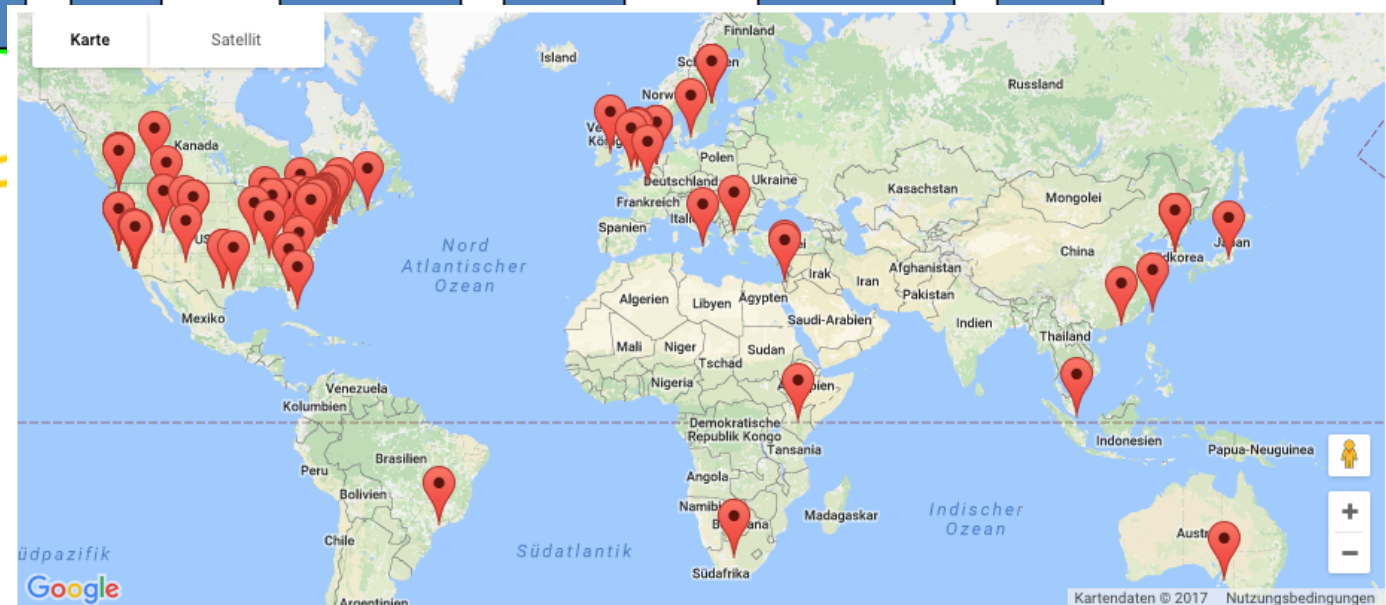
Christian Maier

Lehrstuhl für Medizinische Informatik Erlangen





Analysis method

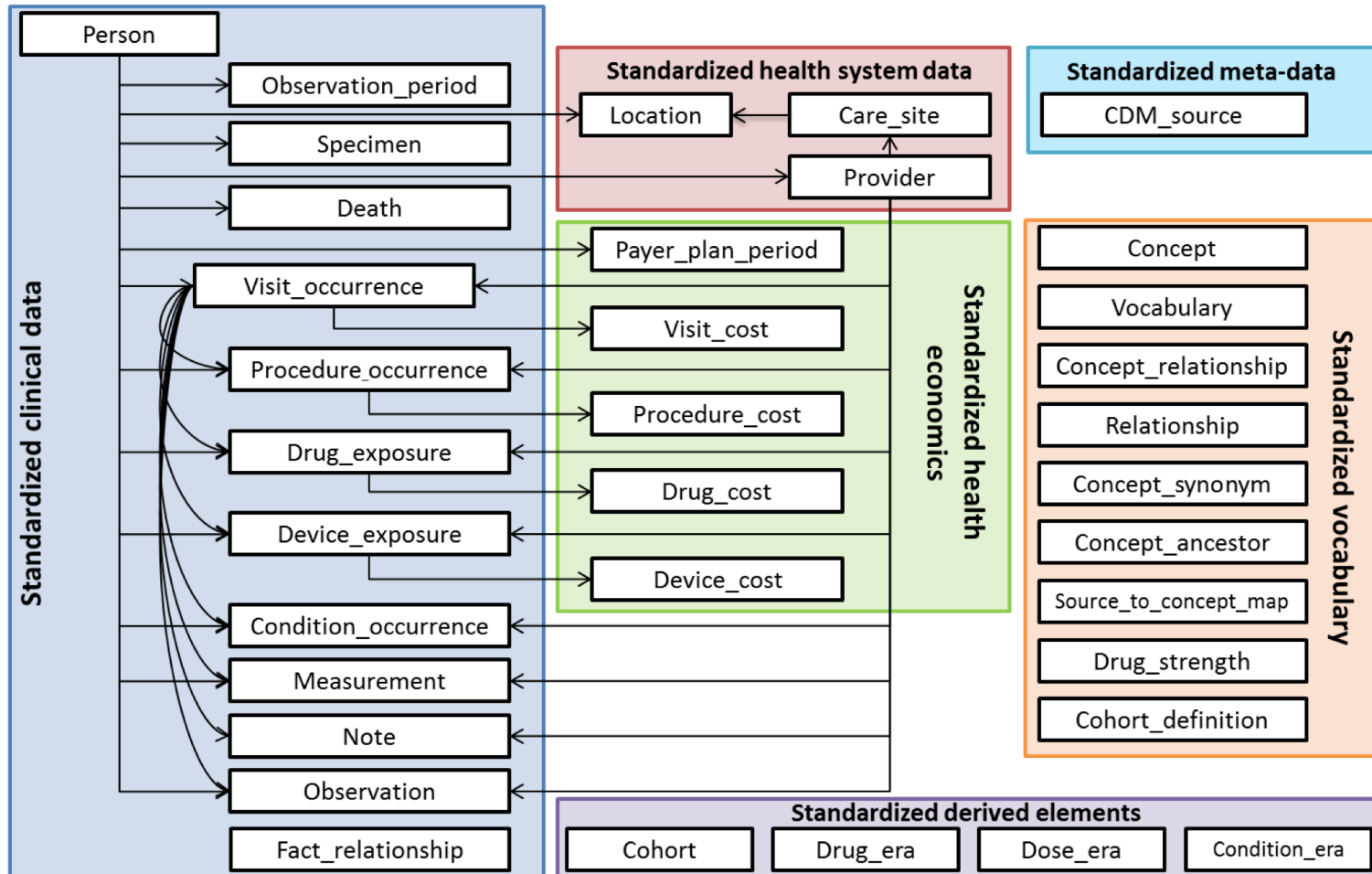


OMOP, the Project (2008-2012) OHDSI, the Movement

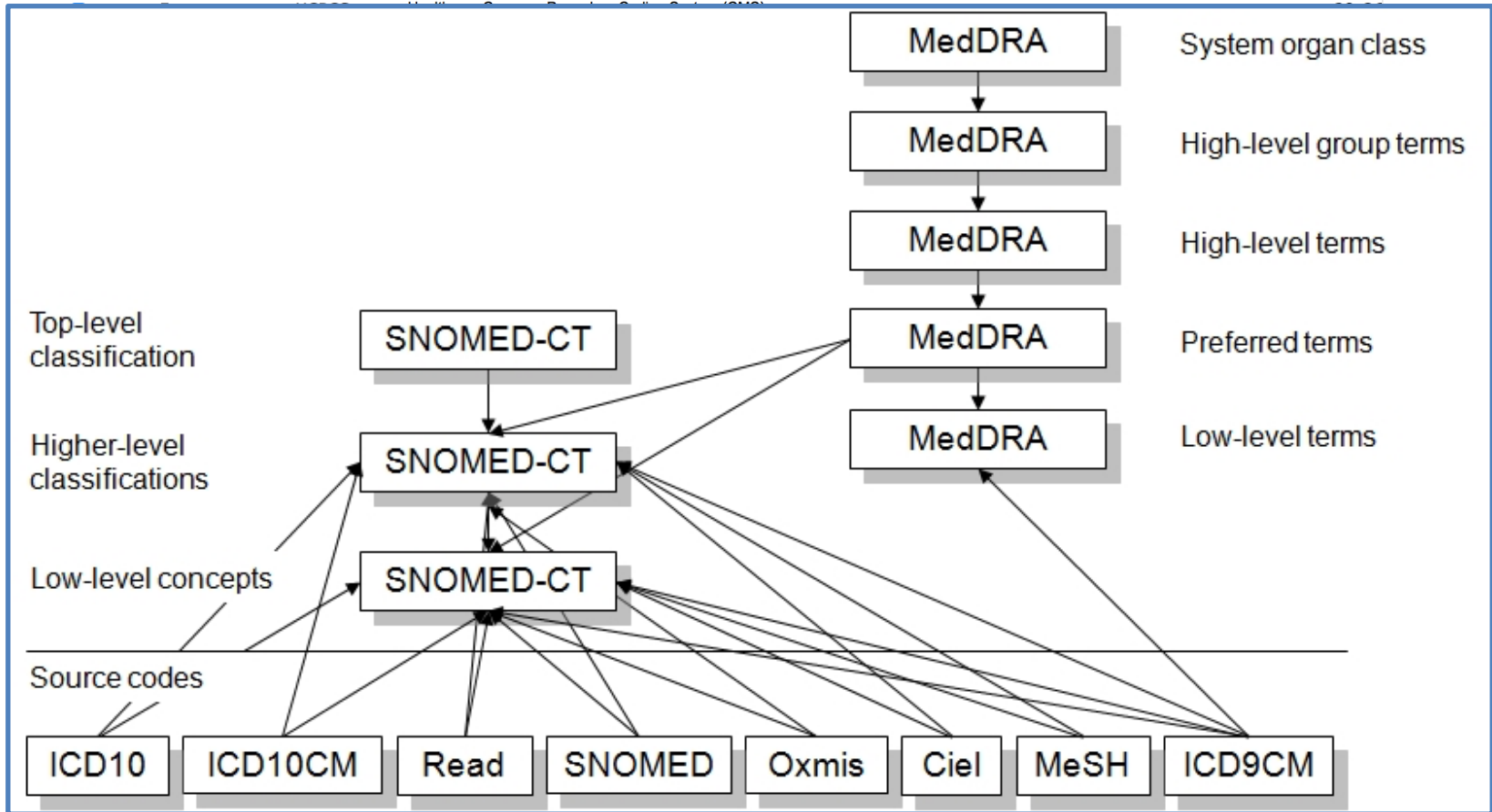
- Observational Medical Outcomes Partnership (OMOP)
 - Public-Private-Partnership: Pharmaceutical Research and Manufacturers of America (PhRMA), FDA, Foundation for the National Institutes of Health (FNIH)
 - „correlations between individual medical interventions and specific health outcomes“
 - **OMOP Common Data Model** und **Standardized Vocabularies**
- Observable Health Data Sciences and Informatics (OHDSI)
 - Weiterentwicklung des Data Models
 - Pflege der Terminologien
 - Open Source Toolbox
 - Community Management
 - Webinars
 - Jährliche Treffen



OMOP CDM V5



Vocabulary ID (CDM V4.5)	Vocabulary code (CDM V5)	VOCABULARY NAME	Available	Latest update
<input checked="" type="checkbox"/>	1	SNOMED	Systematic Nomenclature of Medicine - Clinical Terms (IHTSDO)	31-JAN-2017
<input checked="" type="checkbox"/>	2	ICD9CM	International Classification of Diseases, Ninth Revision, Clinical Modification, Volume 1 and 2 (NCHS)	01-OCT-2016
<input checked="" type="checkbox"/>	3	ICD9Proc	International Classification of Diseases, Ninth Revision, Clinical Modification, Volume 3 (NCHS)	01-OCT-2016
<input checked="" type="checkbox"/>	4	CPT4	Current Procedural Terminology version 4 (AMA)	11-MAR-2017



<input checked="" type="checkbox"/>	50	SPL	Structured Product Labeling (FDA)	16-OCT-2016
<input type="checkbox"/>	53	GCN_SEQNO	Clinical Formulation ID (FDB)	19-NOV-2016
<input type="checkbox"/>	54	CCS	Clinical Classifications Software for ICD-9-CM (HCUP)	Currently not available
<input type="checkbox"/>	55	OPCS4	OPCS Classification of Interventions and Procedures version 4 (NHS)	01-OCT-2016

ETL-Tools



Overview Table

Status	Source code	Source term	Frequency	Match term	Match score	Concept ID	Concept name	Domain	Concept class	Vocabulary	Concept code
unchecked	A	General and uns.	26	Alignment ex. m.	0.76	4244571	Generalized	Observation	Qualifier Value	SNOMED	9132005
unchecked	B	Blood, bloodf.	4	Blood en blood.	0.44	4133507	Organic mech.	Observation	Qualifier Value	SNOMED	278925002
unchecked	D	Digestive	17	Tractus digest.	1.00	436891	Adverse react.	Condition	Clinical Finding	SNOMED	218950001
unchecked	F	Ere	219	Org	1.00	373499	Disorder of eye	Condition	Clinical Finding	SNOMED	371409005
unchecked	H	Ear	87	Oor	1.00	4037611	Ear structure	Spec Anatomic	Body Structure	SNOMED	117590005
unchecked	K	Cardiovascular	14	Tractus circulat.	1.00	4014241	Structure of ear	Spec Anatomic	Body Structure	SNOMED	113257007
unchecked	L	Musculoskeletal	38	Bewegingsapp.	0.93	4244562	Disorder of m.	Condition	Clinical Finding	SNOMED	928309
unchecked	N	Neurological	2044	Zenuwstelsel	1.00	4192658	Neurology	Observation	Qualifier Value	SNOMED	384591006
unchecked	P	Psychological	224	Psychische pro.	1.00	4244513	Psychologic	Observation	Qualifier Value	SNOMED	60224009
unchecked	R	Respiratory	27	Tractus respirat.	0.86	4024567	Respiratory ind.	Condition	Clinical Finding	SNOMED	196048009
unchecked	S	Skin	59	Huid en subcutis	1.00	200174	Disorder of skin	Condition	Clinical Finding	SNOMED	80659006

Selected Mapping

Source code	Source term	Frequency	Aligment
A	General and unspecified	26	

Synonym	Concept ID	Concept name	Domain	Concept class	Vocabulary	Concept code
generalized	4244571	Generalized	Observation	Qualifier Value	SNOMED	60132005

Search Facility

Search Query

Use source term as query

Query:

Filters

Filter by automatically select concepts

Filter invalid concepts

Filter by concept class: Admin Concept

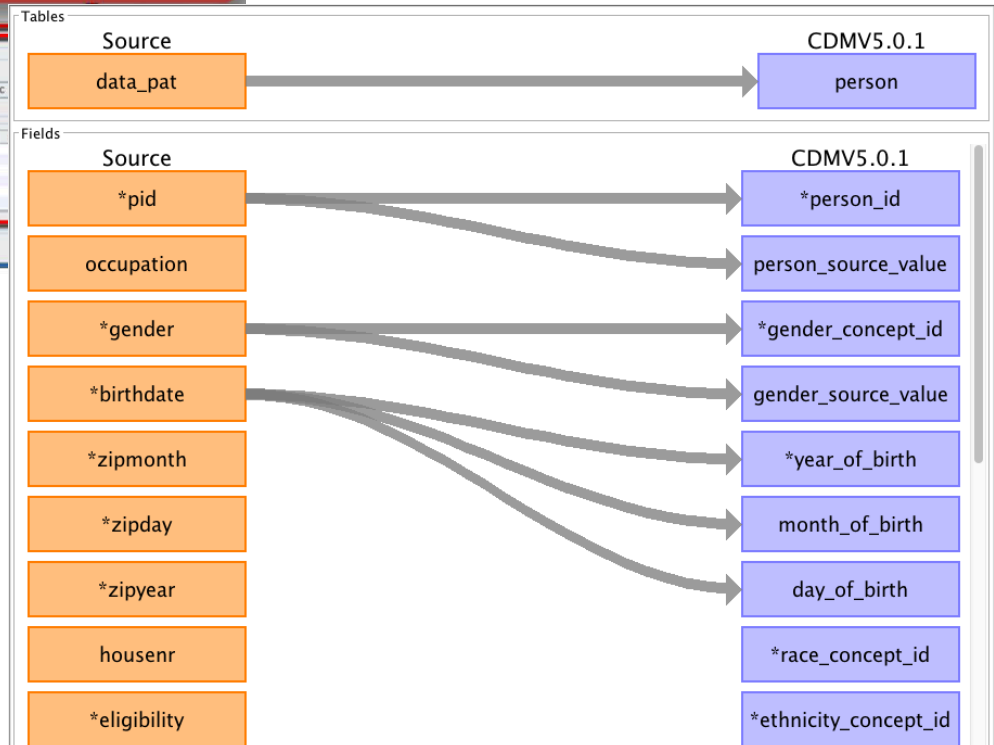
Filter by vocabulary: APC

Filter by domain: Condition

Results

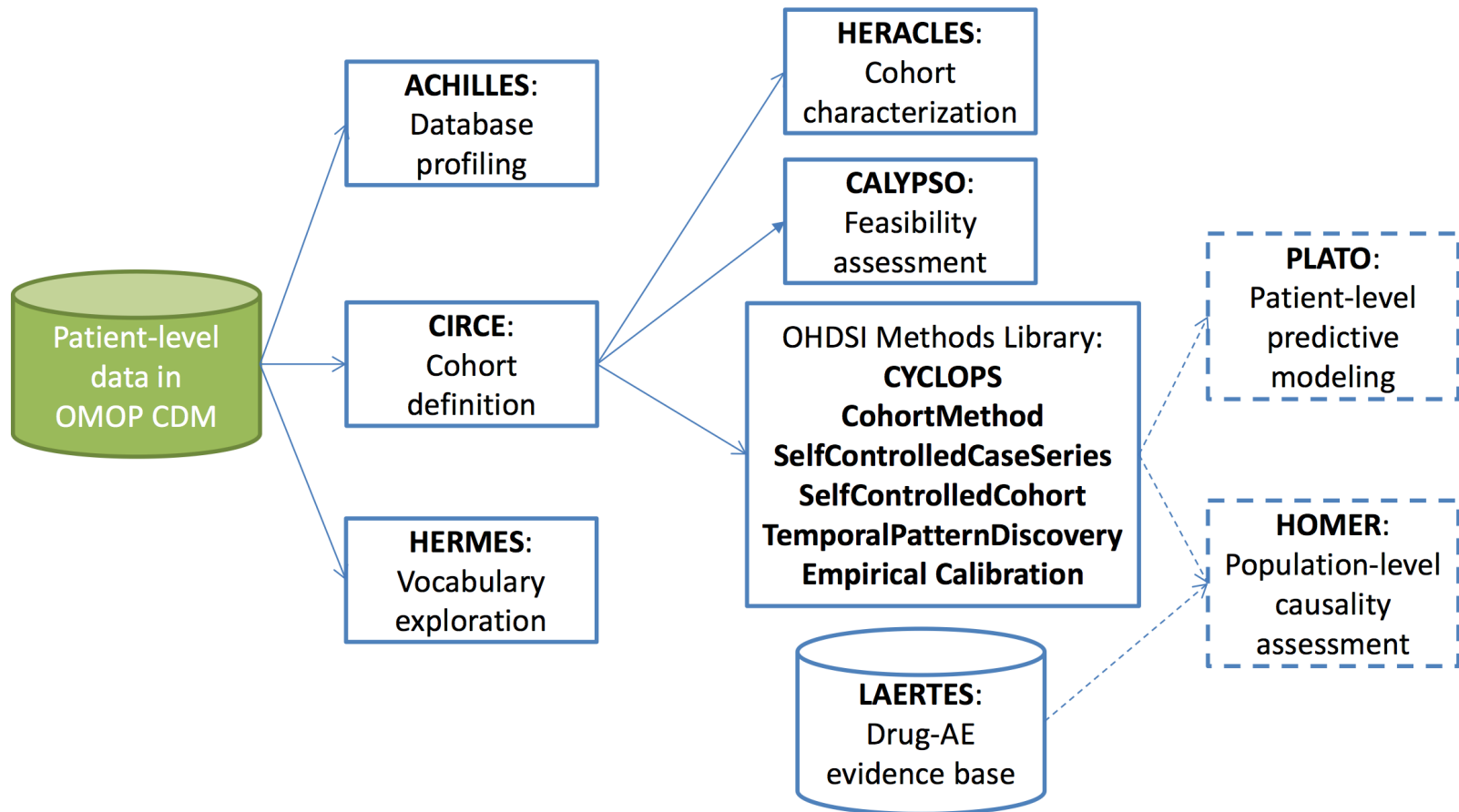
Score	Synonym	Concept ID	Concept name	Domain	Concept class	Vocabulary	Concept code	valid start date	Valid end date
0.70	generalized	4244571	Generalized	Observation	Qualifier Value	SNOMED	60132005	19700101	20991231
0.97	Generalized and	321882	Generalized and	Condition	Clinical Finding	SNOMED	38823006	19700101	20991231
0.59	Unspecified	4001894	Non-specific	Observation	Qualifier Value	SNOMED	10003008	19700101	20991231
0.57	Generally contrac.	444293	Contracted pupils	Condition	Clinical Finding	SNOMED	871095	19700101	20991231
0.55	General observat.	4021181	General observat.	Procedure	Procedure	SNOMED	225414002	19700101	20991231
0.54	Production super.	4103833	Production super.	Observation	Social	SNOMED	25648006	19700101	20991231

Approved / total: 0 / 1054 0.0% of total frequency





Standardized large-scale analytics tools under development within OHDSI



Ongoing Studies

- Early Treatment Pathways in Chronic Disease
- Drug Utilization in Children
- Celecoxib versus Naproxen
- Predicting outcome
- Learning Effective
- SeaWAS: Birth Mo
- Quality of Race and
- Data Quality Study
- Large-Scale Predic
- Large-Scale Popula
- Risk of hip fracture

Treatment Pathways in Chronic Disease

Objective: The objective of this study is to characterize the prevalence of different treatment pathways for three chronic diseases: Hypertension, Type II Diabetes, and Depression. We will systematically summarize the treatment pathways observed among patients who have at least 3 years of continuous observation and persistent treatment following initiation. We will study temporal trends, and will further stratify by data source to determine population, geography, and data capture process.

Rationale: While numerous treatment guidelines exist for chronic conditions, the real-world treatment pathways that patients experience in practice are essential for establishing context around questions of drug utilization, adherence, and outcomes.

Project Leads: Patrick Ryan, Jon Duke, George Hripcsak, Martijn Schreiner

Coordinating Institution(s): Janssen R&D, Columbia University, Regen

Additional Participants:

Full Protocol: [Hypertension Treatment Pathways 12-4-2014](#)

Initial Proposal Date: 12/3/2014

Launch Date: 12/5/2014

Study Closure Date: 12/31/2014

Results Submission: [Email](#) or SFTP

Requirements

CDM: V4 or V5

Database Dialect: SQL Server, Postgres, Oracle

Software: SQL as above, R (optional)

Code

<https://github.com/OHDSI/StudyProtocols>

Discussion

[Treatment Pathways Discussion Thread](#)

Datasets Run

- Truven
- Optum
- CPRD
- Indiana Network for Patient Care

research:treatment_pathways_in_chronic_disease

This repository | Search | Pull requests | Issues | Gist

OHDSI / StudyProtocols | Watch 29 | Star 8 | Fork 12

Code | Issues 7 | Pull requests 0 | Projects 0 | Pulse | Graphs

Branch: master | StudyProtocols / DrugsInPeds / | Create new file | Upload files | Find file | History

File	Commit	Time
..	Latest commit 628f16a	12 days ago
R	Added analysis focused on antibiotics	2 months ago
extras	Faceting graphs by DB	12 days ago
inst	Bumped version number. Stored R environment snapshot.	2 months ago
man	Moved from ATC to custom drug classification	a year ago
.Rbuildignore	Moved from ATC to custom drug classification	a year ago
.gitignore	Moved DrugsInPeds study from sandbox to here.	2 years ago
DESCRIPTION	Bumped version number. Stored R environment snapshot.	2 months ago
DrugsInPeds.Rproj	Moved DrugsInPeds study from sandbox to here.	2 years ago
NAMESPACE	Moved from ATC to custom drug classification	a year ago
README.md	Moved DrugsInPeds study from sandbox to here.	2 years ago

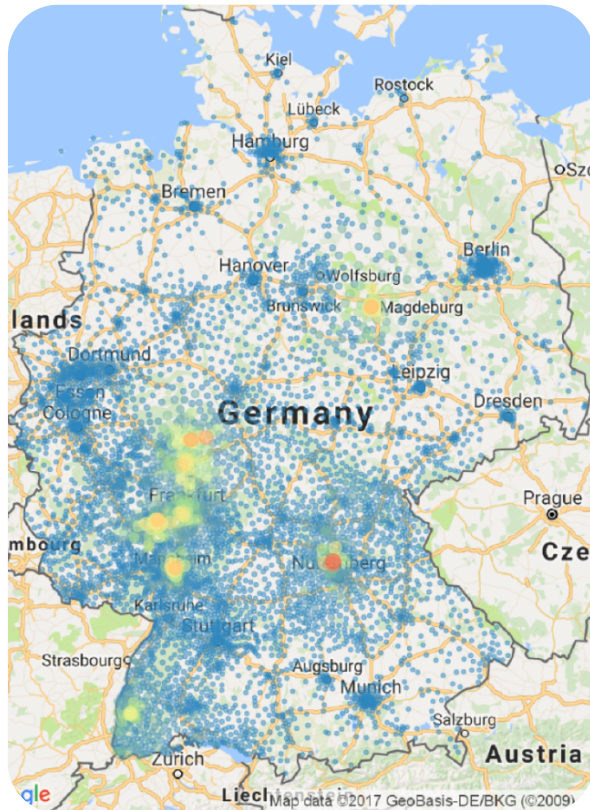
OHDSI Drug Utilization in Children Protocol

This study aims to measure the prevalence of drug use in children in several countries in Asia. We will compute prevalence for all drugs captured in the databases in the pediatric population. The main analysis will focus on drug classes (anatomical and therapeutic) and these prevalences will be stratified by year to evaluate temporal trends. A secondary analysis will report the five top ingredients per anatomical class per country. All analysis will be stratified by age (< 2 years, 2-11 years, and 12-18 years), and by setting (inpatient or ambulatory care). Detailed information and protocol is available on the [OHDSI Wiki](#).

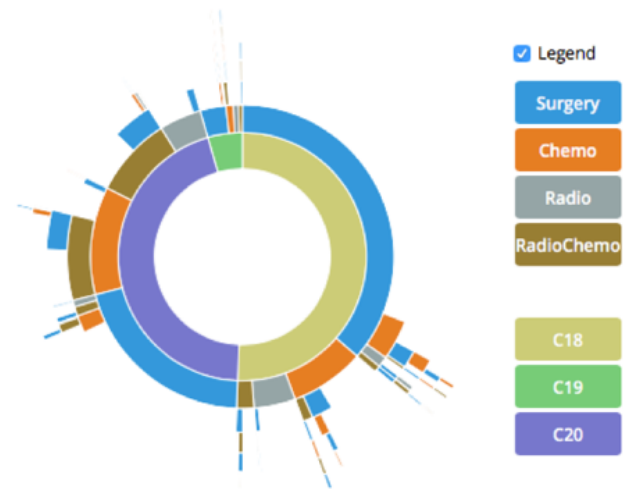
How to run

1. Make sure that you have Java installed. If you don't have Java already installed on your computer (on most computers it already is installed), go to java.com to get the latest version. (If you have trouble building with rJava below, be sure on Windows that your Path variable includes the path to jvm.dll (Windows Button --> type "path" --> Edit Environmental Variables --> Edit PATH variable, add to end: C:\Program Files\Java\jre6\bin\server) or wherever it is on

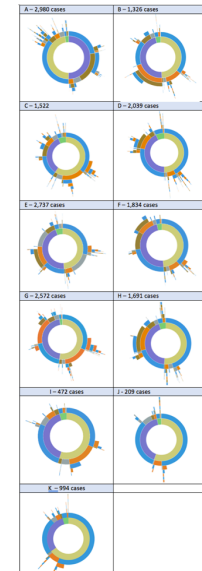
MI-Initiative: Konzeptphase



Catchment Area of MIRACUM Partners

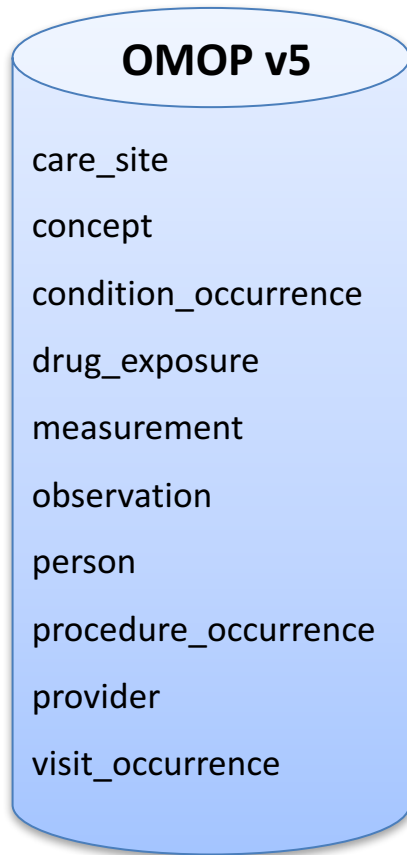


Combined Sunburst-Plot of 18,376 Cases from 11 University Hospitals

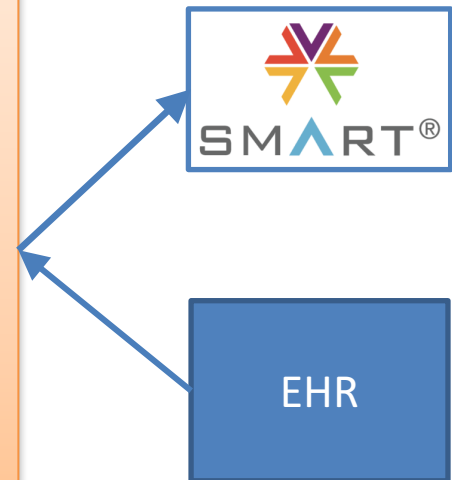
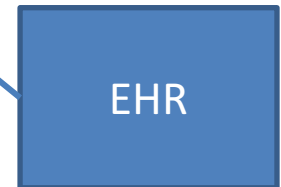
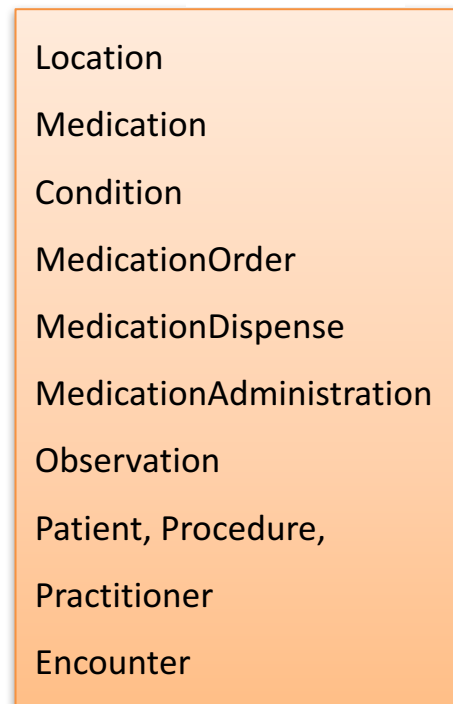


- 11 Universitätskliniken
- 3,3 Mio Patienten
- 30 Mio Diagnosen
- 23 Mio Prozeduren

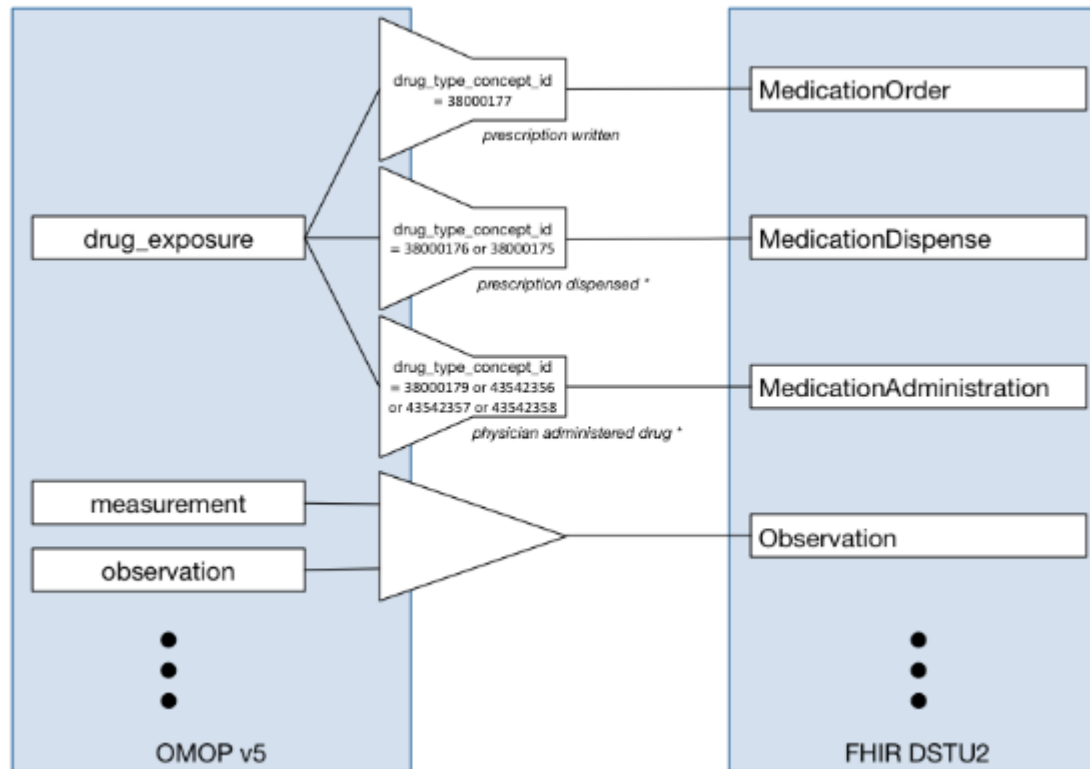
OMOP on FHIR



<Hapi/> FHIR[®] DSTU2



OMOP on FHIR



Quelle: M. Choi, R. Starr, M. Braunstein, J. Duke. "OHDSI on FHIR Platform Development with OMOP CDM mapping to FHIR Resources". http://www.ohdsi.org/web/wiki/lib/exe/fetch.php?media=resources:ohdsionfhir_gatech.pdf

<https://github.com/gt-health/GT-FHIR>

Ausblick

- OMOP als CDM
- OHDSI ist eine aktive Community, die viele Werkzeuge entwickelt
 - www.ohdsi.org
 - github.com/OHDSI
- Work in Progress, lebt vom Mitmachen
 - (noch) keine OMICS-Daten, Tumordokumentation, Geovisualisierung
 - Keine föderierte Abfrage
- OMOP on FHIR
 - SMART on FHIR (<https://smarthealthit.org>)
- Deutsch?
 - ICD10GM, Mapping OPS<->SNOMED
 - Deutsche Übersetzung MedDRA, LOINC, ...
 - Verlegungsketten, Abrechnungsdaten, ...