EMR 표준화 Coding을 통한 Registry 구축

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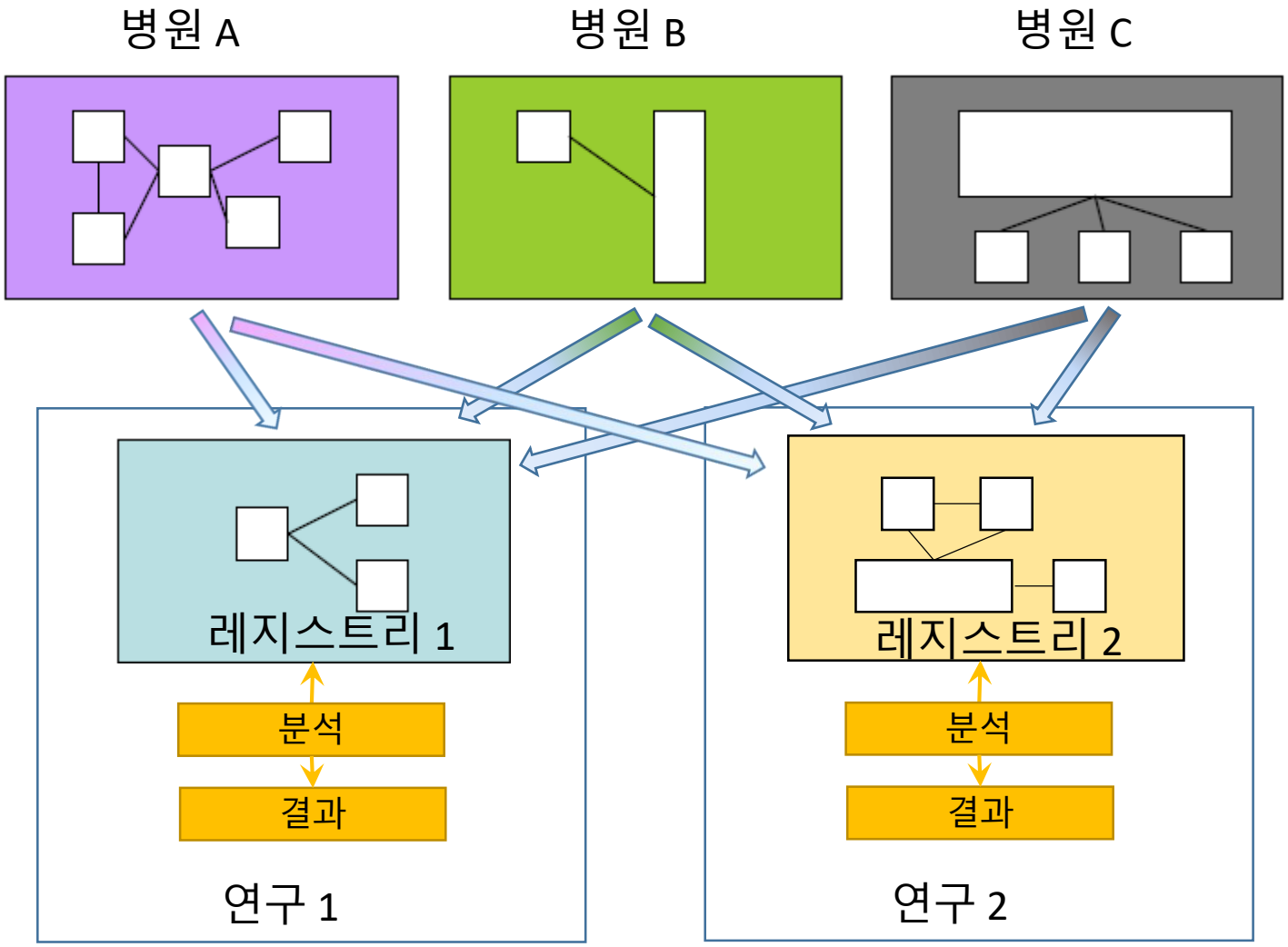
아주대학교 의과대학
의료정보학과

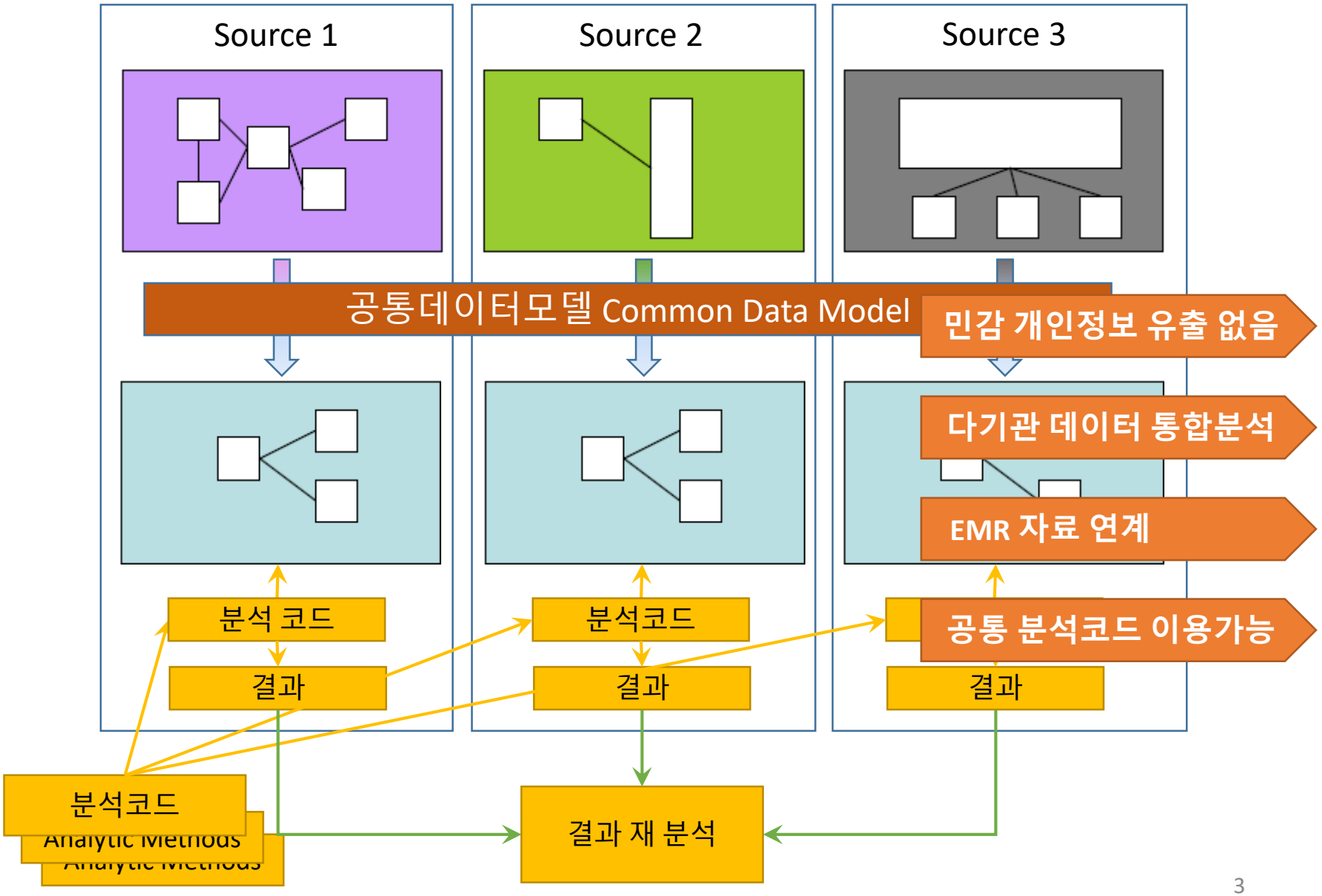
다기관 연계 자료 분석 방법: 현재

연구 수행 때마다 데이터 모델을 맞추는 변환 작업을 수행해야 함



연구재현성 없음, 재사용되지 않음

분산연구망


Source 1
Source 2
Source 3
공통데이터모델 Common Data Model
민감 개인정보 유출 없음
다기관 데이터 통합분석
EMR 자료 연계
분석 코드
분석코드
공통 분석코드 이용가능
결과
결과
결과
분석코드
Analytic Methods
결과 재 분석

임상빅데이터를 이용한 연구 예시

oo, 고혈압, 우울증

COLLOQUIUM PAPER

Characterizing treatment pathways at scale using the OHDSI network

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Edited by Richard M. Shiffrin, Indiana University, Bloomington, IN, and approved April 5, 2016 (received for review June 14, 2015)

Observational research promises to complement experimental research by providing large, diverse populations that would be infeasible for an experiment. Observational research can test its own clinical hypotheses, and observational studies also can contribute to the design of experiments and inform the generalizability of experimental research. Understanding the diversity of populations and the variance in care is one component. In this study, the Observational Health Data Sciences and Informatics (OHDSI) collaboration created an international data network with 11 data sources from four countries, including electronic health records and admin-

Without sufficiently broad databases available in the first stage, randomized trials are designed without explicit knowledge of actual disease status and treatment practice. Literature reviews are restricted to the population choices of previous investigations, and pilot studies usually are limited in scope. By exploiting the ClinicalTrials.gov national trial registry (9) and electronic health records, researchers already have demonstrated the discrepancy between targeted populations and populations available for study (10), raising the concern that designs may not be optimal. Designs cannot be based simply on current treatment recom-

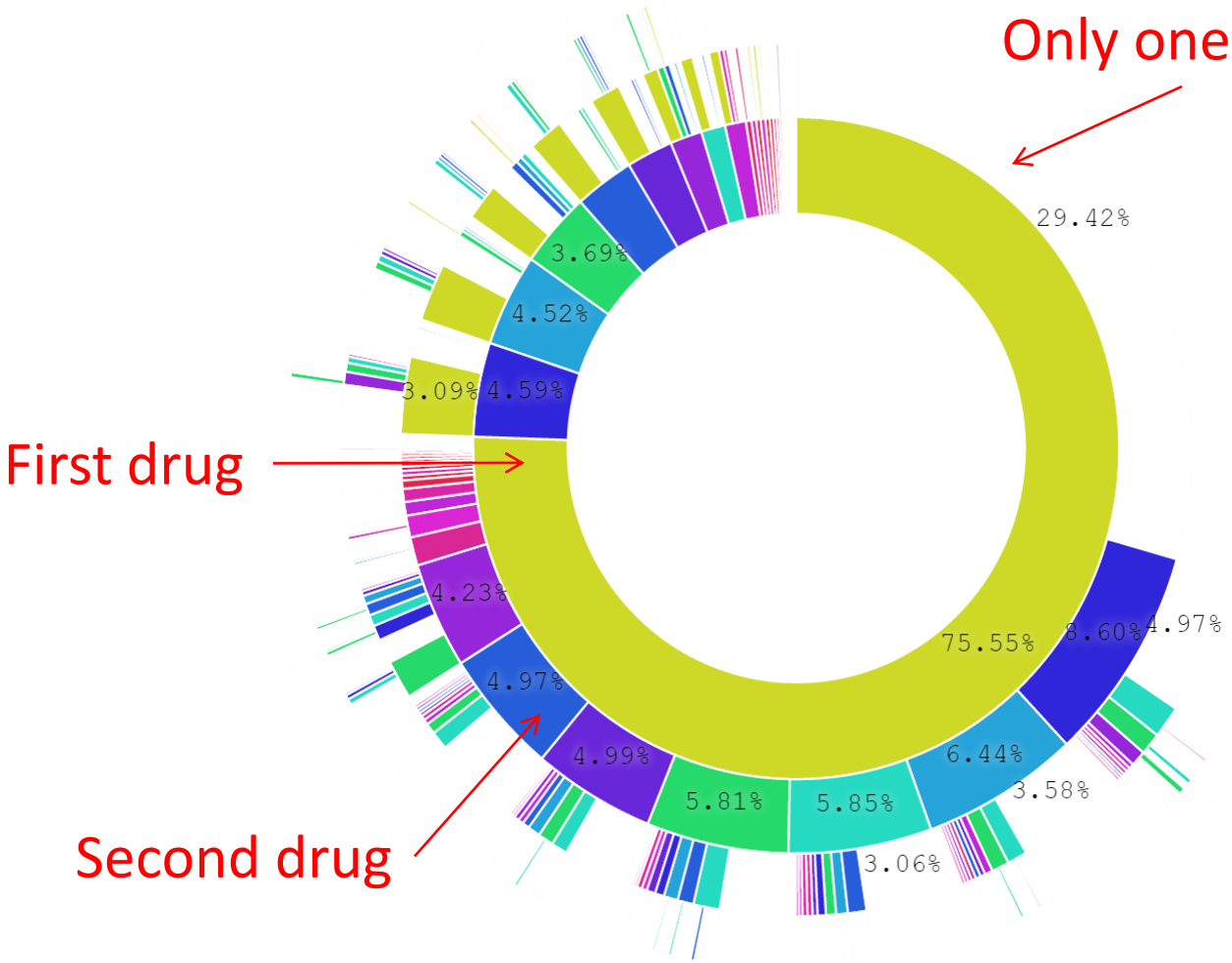
MEDICAL SCIENCES

2억 5천만명
5개국 12개
데이터베이스

연구에 이용된 임상빅데이터

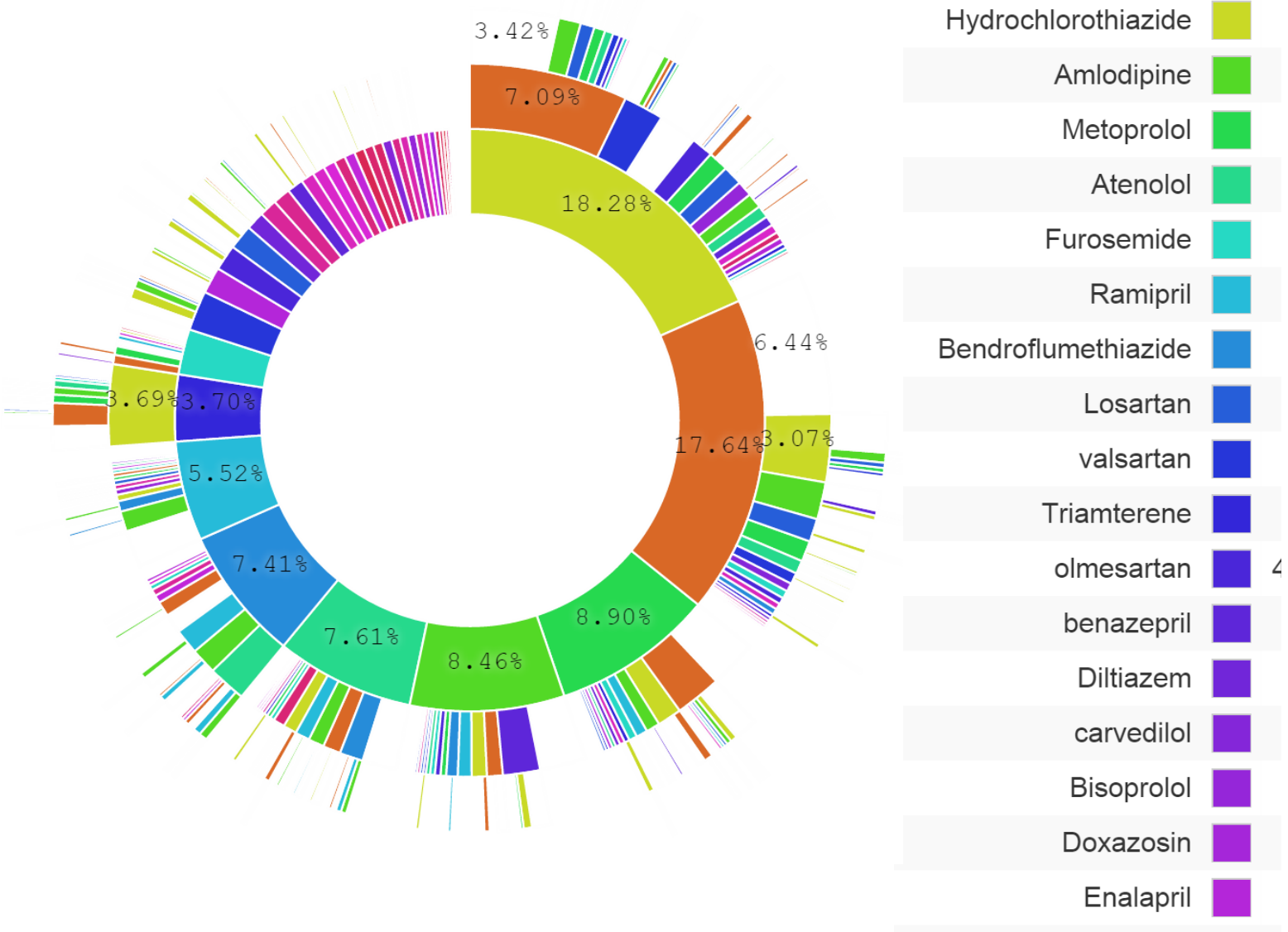
Code	Name	Description	Size (M)
AUSOM	Ajou University School of Medicine	South Korea; inpatient hospital EHR	2
CCAE	MarketScan Commercial Claims and Encounters	US private-payer claims	119
CPRD	UK Clinical Practice Research Datalink	UK; EHR from general practice	11
CUMC	Columbia University Medical Center	US; inpatient EHR	4
GE	GE Centricity	US; outpatient EHR	33
INPC	Regenstrief Institute, Indiana Network for Patient Care	US; integrated health exchange	15
JMDC	Japan Medical Data Center	Japan; private-payer claims	3
MDCD	MarketScan Medicaid Multi-State	US; public-payer claims	17
MDCR	MarketScan Medicare Supplemental and Coordination of Benefits	US; private and public-payer claims	9
OPTUM	Optum ClinFormatics	US; private-payer claims	40
STRIDE	Stanford Translational Research Integrated Database Environment	US; inpatient EHR	2
HKU	Hong Kong University	Hong Kong; EHR	1

당뇨병 치료 패턴

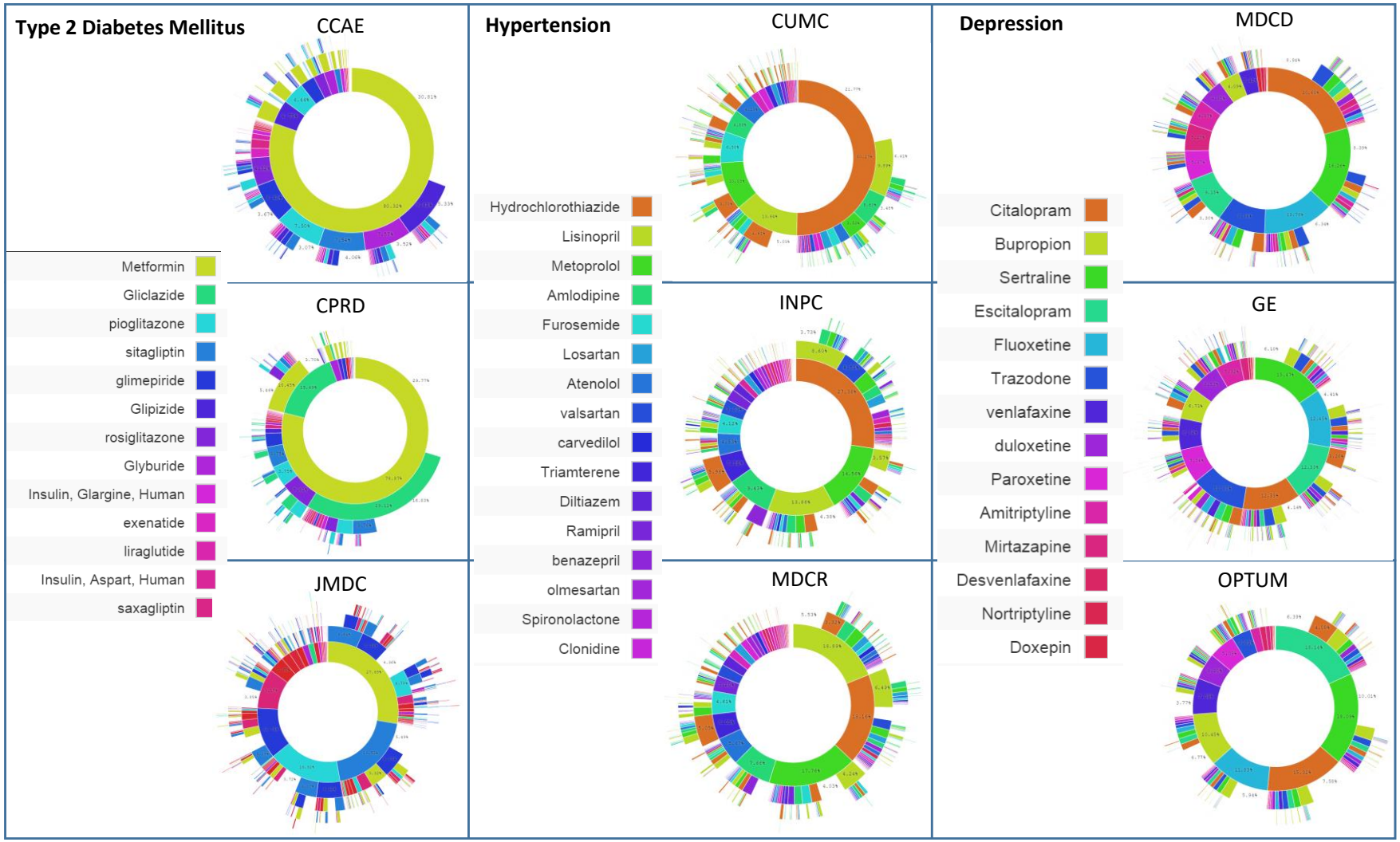


- Metformin
- pioglitazone
- sitagliptin
- Glipizide
- glimepiride
- Gliclazide
- Glyburide
- rosiglitazone
- Insulin, Glargine, Human
- exenatide
- Insulin, Aspart, Human
- liraglutide
- saxagliptin
- Insulin, Lispro, Human
- Glucose
- Insulin, Isophane, Human

고혈압 치료 패턴


3.42%
7.09%
18.28%
6.44%
17.64%
3.07%
3.69%
3.70%
5.52%
7.41%
7.61%
8.46%
8.90%
Lisinopril
Hydrochlorothiazide
Amlodipine
Metoprolol
Atenolol
Furosemide
Ramipril
Bendroflumethiazide
Losartan
valsartan
Triamterene
olmesartan
benazepril
Diltiazem
carvedilol
Bisoprolol
Doxazosin
Enalapril

기관별/국가별 치료법의 이질성 확인



공통데이터모델 기반 분산연구망 종류

NYC-CDRN
New York City Clinical Data Research Network

pSCANNER

OHDSI
OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS
오딧세이 컨소시엄

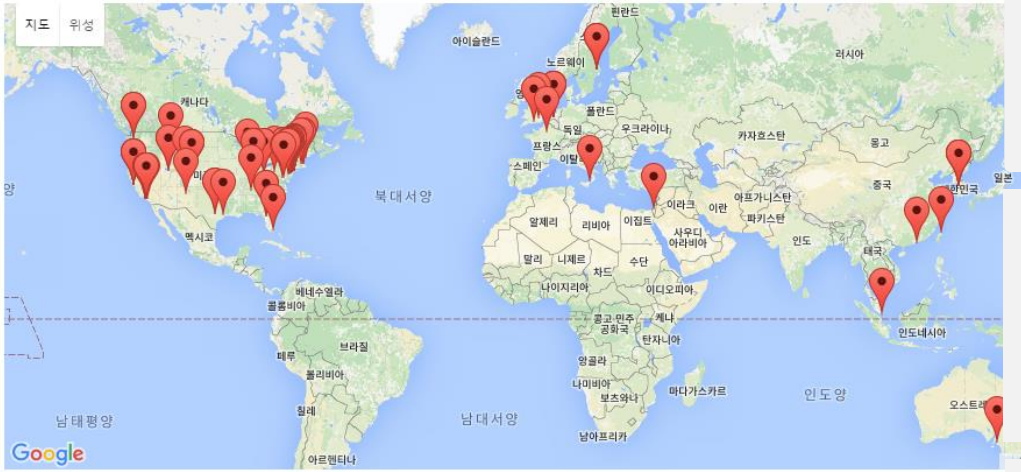
PEDSnet
A Pediatric Learning Health System

pcornet
The National Patient-Centered Clinical Research Network

OHDSI 컨소시엄

- OHDSI (Observational Health Data Sciences and Informatics)
  - OMOP 공통데이터모델을 기반으로 오픈소스 툴을 개발하고 분산형 연구망 구축을 목표

Collaborators



OHDSI
- OMOP의 모든 연구자들이 합류
- 전세계 118개 이상의 기관 참여

국제 표준화 플랫폼
- OMOP 공통데이터모델 기반
- 분산 연구망을 이용한 공동 연구 가능

OMOP 공통데이터모델 구축 현황
- 17 국가 / 64 데이터베이스
- 12억 6천만명의 환자 데이터

OHDSI 툴 개발 현황
- 101개 오픈소스 툴이 개발 완료 혹은 개발 진행 중

- **Objectives**

Innovation : we encourage fresh methodological approaches from disruptive thinking
Reproducibility : we sought reproducible and well–calibrated evidence avoiding bias
Community : everyone is welcome to participate in OHDSI
Collaboration : we work collectively
Openness : all our community's process open
Beneficence : we seek to protect the rights of individuals and organizations

오딧세이 데이터 네트웍내 임상빅데이터

Database	Data Type	Country	# of Patients (x1000)
AltaMed Health Services	EHR	USA	638
ARS	Claims	Italy	4,000
AUSOM (Ajou Univ. School Of Medicine)	**EHR**	**Korea**	**2,610**
BTRIS	EHR/CTDMS	USA	500
Clinical Practice Research Datalink (CPRD)	EHR	UK	11,560
CMSMedicare (Synthetic PUF)	Claims	USA	2,000
DARTNet Institute: CER2 Study	Clinical – 30 organizations	USA	1,300
Department of Veterans Affairs	EHR		
Flatiron	EMR		
HCUP NIS	Clain		
ICPI	EHR		
IMS Ambulatory EMR	EMR		
IMS Ambulatory EMR - Canada	EMR		
IMS Ambulatory EMR linked claims	Clain		
IMS Disease Analyzer - France	Clain		
IMS Disease Analyzer - Germany	Claims	Germany	8,875
IMS Oncology Analyzer - France	Survey	France	4.2
IMS Oncology Analyzer - Germany	Survey	Germany	6
IMS Oncology Analyzer - Spain	Survey	Spain	4
IMS Oncology EMR	EMR	US	2,059
IMS Pharmetrics Plus	Claims	USA	105,009
Indiana Network for Patient Care	HIE	USA	11,900
Intermountain	EHR	USA	1,125
Japan Medical Data Center (JMDC)	Claims	Japan	2870
MEPS	Survey	USA	
NHANES	Survey	USA	72

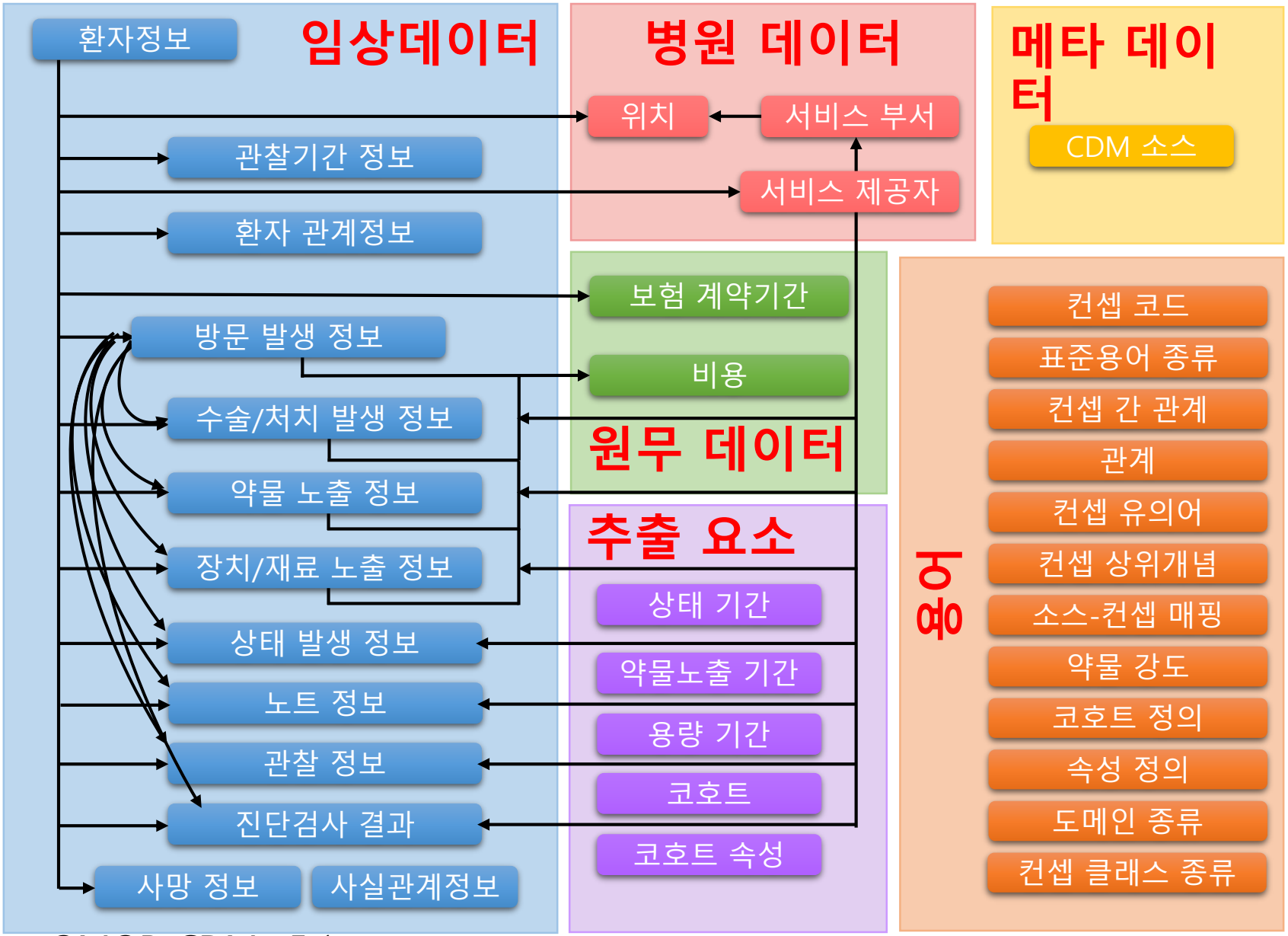
	USA	6,000
	USA	4,500
	USA	40,670
ling	USA	107970
l information system; aims	USA	100
l information system	USA	111
al information system; aims"	USA	100
l information system; aims	USA	250
	USA	500
ncer Registry	USA	2,000
	USA	2,011
	Taiwan	2,000
	USA	190
	UK	10,000
	USA	121,850
	USA	9,250
	USA	17,340
tal)	Germany	4,000
	USA	2,200
	USA	1,400
	USA	4,100
	USA	2,200
	USA	3,000
nsing	USA	4.7
atient+Billing)	USA	2,400
	USA	23,327

- **64 databases from 84 organizations**
- **12억6천만명 환자**
- **17개국**
- **1억15만명-outside of US**

공통데이터모델
Common Data Model (CDM)

오몹공통데이터모델: 하나의 모델, 다목적

약물/기기/백신안전성, 비교효과연구, 경제성분석, 의료의질, 임상연구



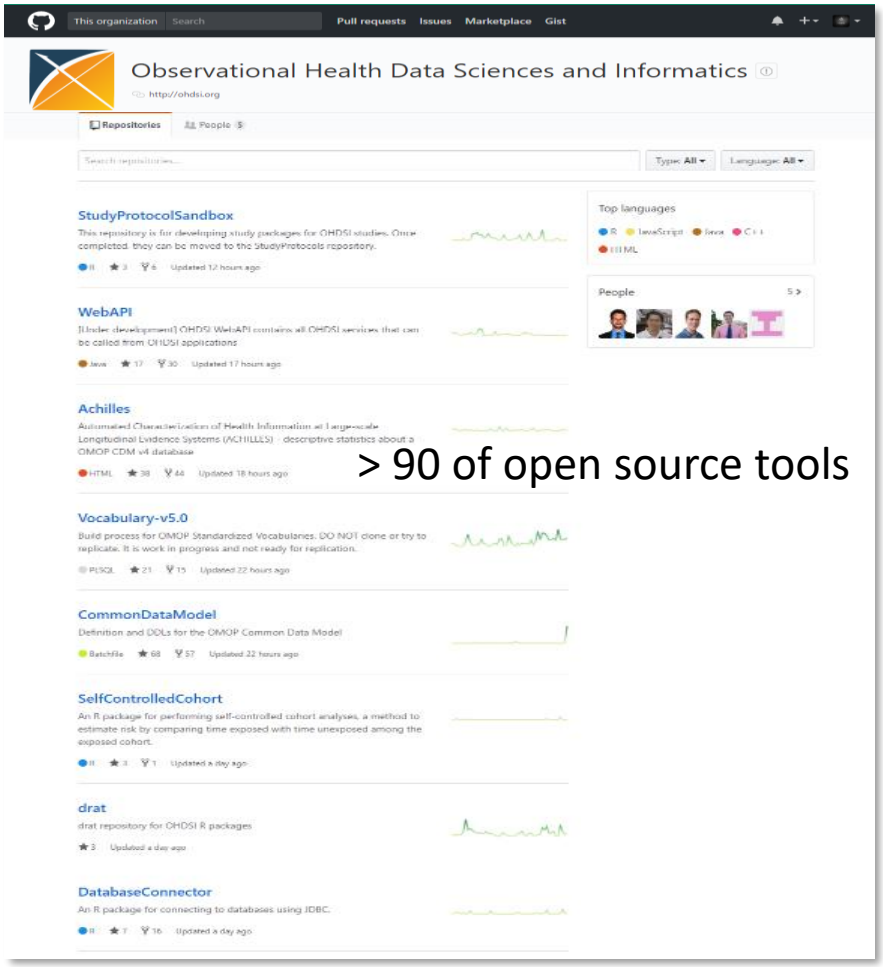
OMOP-CDM v5.1

오픈 이노베이션

소설코딩: 프로그램을 공개적으로 같이 개발, 공동사용

오픈 플랫폼/소셜코딩

- OHDSI(Observational Health Data Sciences and Informatics)의 Github forum



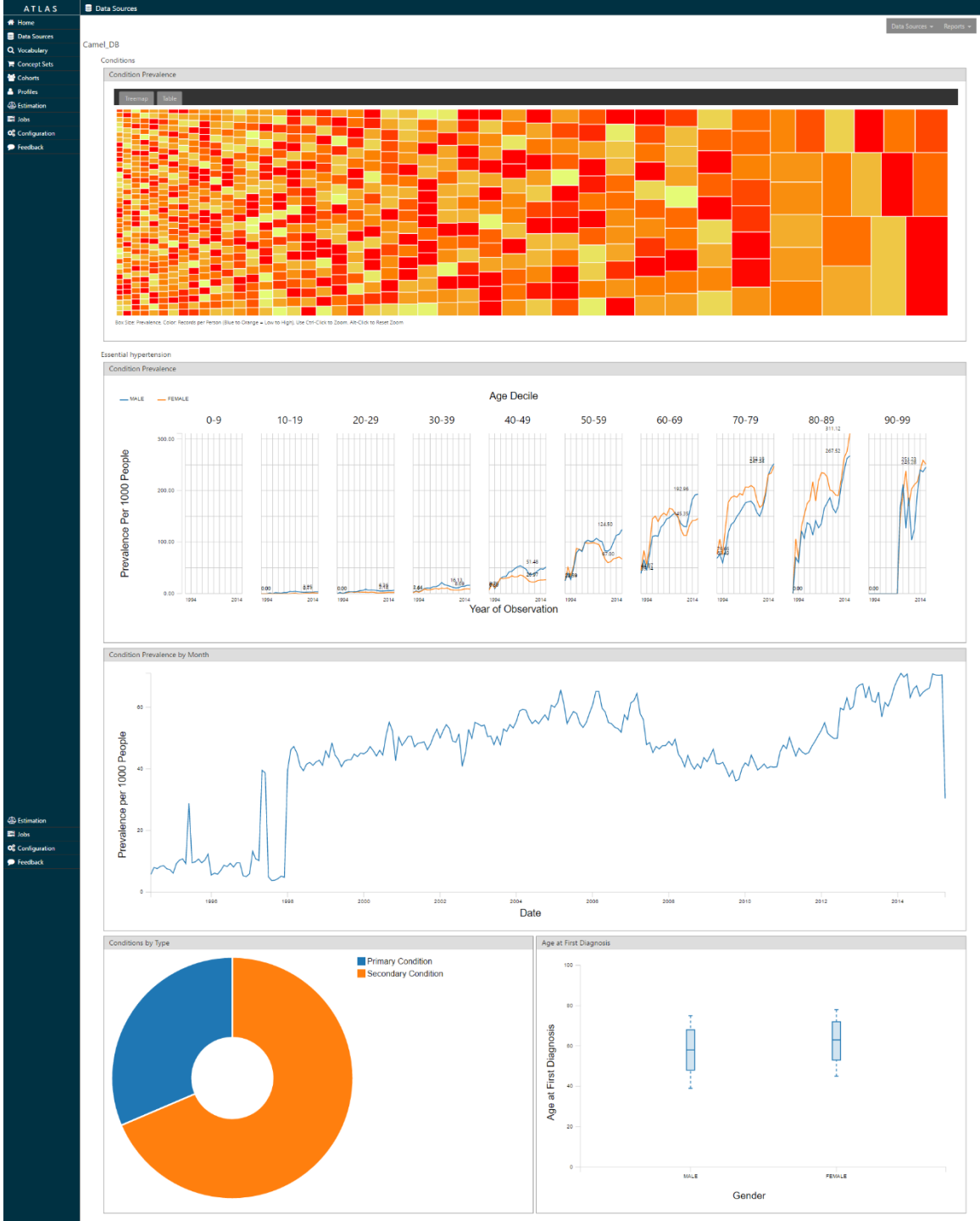
- Public Repository를 통해 다양한 Protocol을 공유하고, 개발자들의 참여를 유도하여 더 나은 품질과 아이디어 생산에 기여
- Open Source로 공개 되어, 누구나 쉽게 참여 및 사용할 수 있음
- Achilles, Atlas, Circe 등의 다양한 분석 Platform과 Cert, Clear 등과 같은 분석 algorithm 및 다양한 분석 API를 공개

아킬레스: 데이터 특징 시각화 툴

ami.ajou.ac.kr:8080

아킬레스:
진단명 검색

연령별, 시기별 트렌드 조회



Malignant tumor, Breast
아주대병원 230만명 22년 자료

Achilles

Data Sources

MEL (ver 16.050.010)

Conditions

Condition Prevalence

Treemap | Table

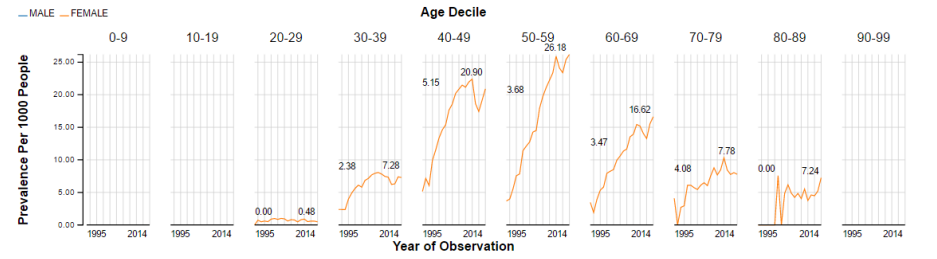
Search: breast | Show / hide columns

SOC	HLT	SNOMED	Person Count	Prevalence	Records per Person
NA	NA	Benign tumor of breast	27,261	1.20%	3.61
NA	NA	Primary malignant neoplasm of breast	5,920	0.26%	28.90
NA	NA	Fibrocystic disease of breast	2,968	0.13%	2.76
NA	NA	Breast finding	1,671	0.07%	2.76
NA	NA	Primary malignant neoplasm of breast upper outer quadrant	1,539	0.07%	5.44

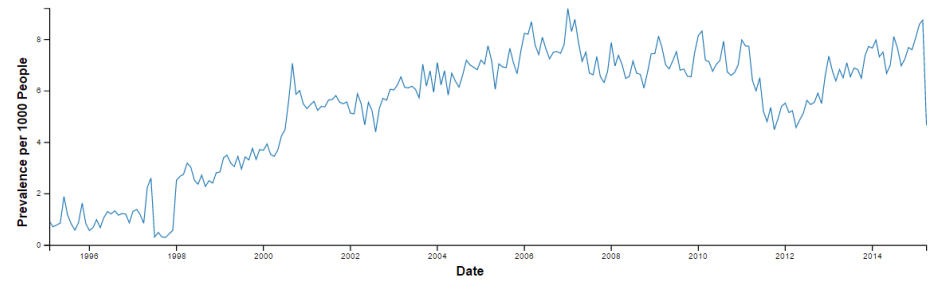
Showing 1 to 5 of 34 entries (filtered from 5,156 total entries) Previous 1 2 3 4 5 6 7 Next

Primary malignant neoplasm of breast

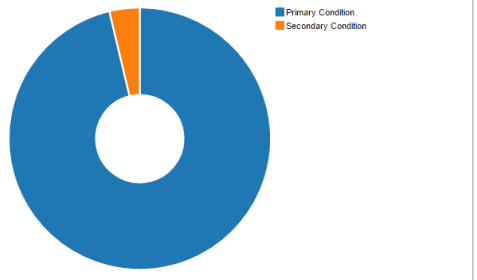
Condition Prevalence



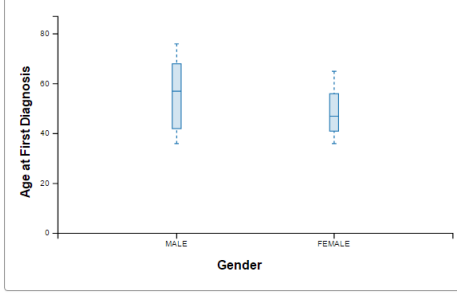
Condition Prevalence by Month



Conditions by Type



Age at First Diagnosis



Malignant tumor, Breast
보험공단 100만명 샘플 10년간 자료

Achilles

Data Sources

IID_16

Conditions

Condition Prevalence

Treemap | Table

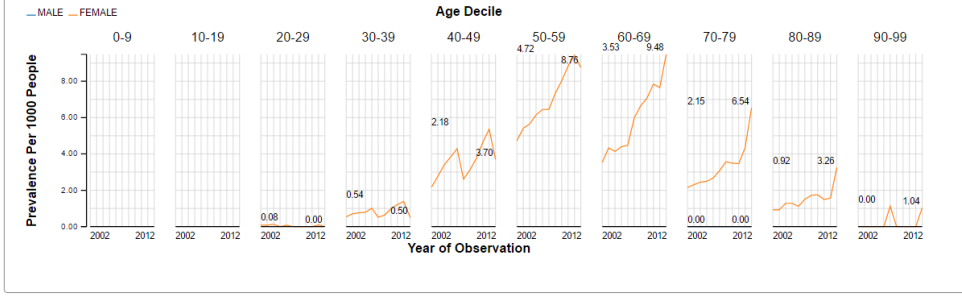
Search: breast | Show / hide columns

SOC	HLT	SNOMED	Person Count	Prevalence	Records per Person
NA	NA	Inflammatory disorder of breast	11,296	1.00%	2.03
NA	NA	Fibrocystic disease of breast	7,569	0.67%	2.06
NA	NA	Fibroadenosis of breast	7,164	0.64%	1.65
NA	NA	Primary malignant neoplasm of breast	4,701	0.42%	29.01
NA	NA	Solitary cyst of breast	3,405	0.30%	1.49

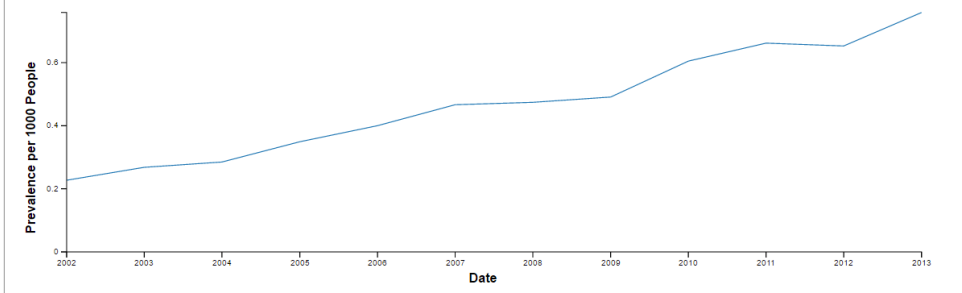
Showing 6 to 10 of 39 entries (filtered from 5,989 total entries) Previous 1 2 3 4 5 … 8 Next

Primary malignant neoplasm of breast

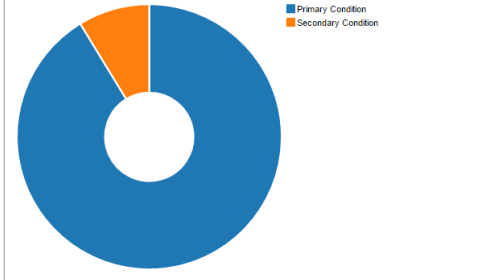
Condition Prevalence



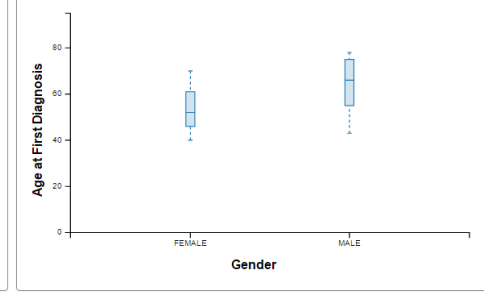
Condition Prevalence by Month



Conditions by Type



Age at First Diagnosis



Malignant tumor, liver
아주대병원 230만명 22년 자료

Achilles

AMEL (ver 16.050.010)

Conditions

Condition Prevalence

Treemap | Table

Search: liver

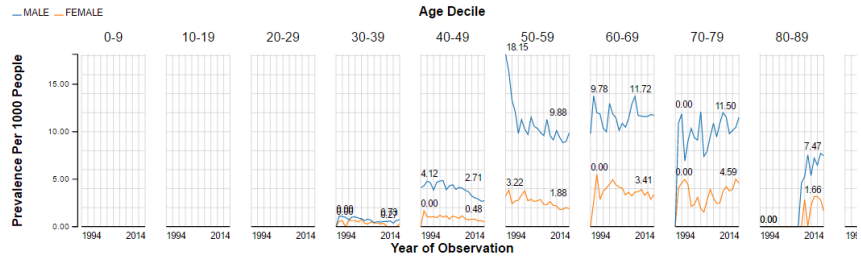
SOC	HLT	SNOMED	Person Count	Prevalence	Records
NA	NA	Disease of liver	23,233	1.02%	
NA	NA	Steatosis of liver	13,677	0.60%	
NA	NA	Toxic liver disease with fibrosis and cirrhosis of liver	8,215	0.36%	
NA	NA	Inflammatory disease of liver	6,598	0.29%	
NA	NA	Liver cell carcinoma	5,544	0.24%	

Showing 1 to 5 of 45 entries (filtered from 5,156 total entries)

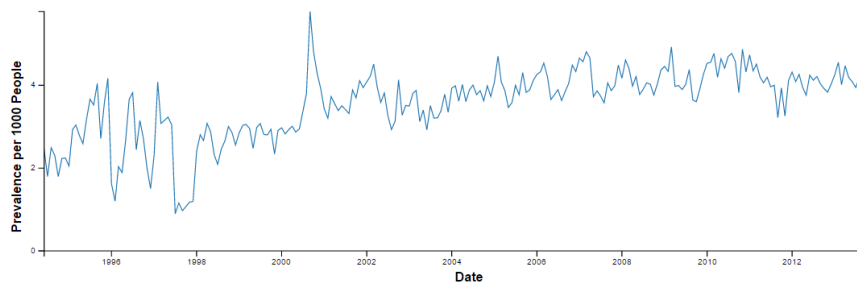
Previous 1 2 3 4 5 ...

Liver cell carcinoma

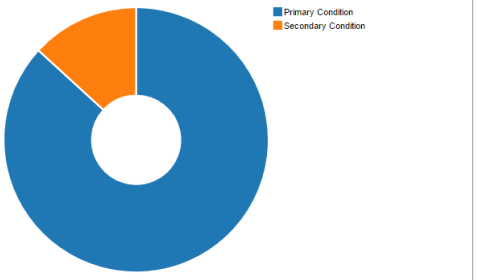
Condition Prevalence



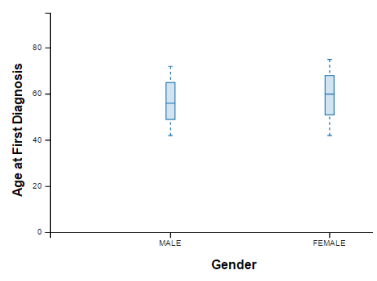
Condition Prevalence by Month



Conditions by Type



Age at First Diagnosis



Malignant tumor, liver
보험공단 100만명 샘플 10년간 자료

Achilles

Data Sources

NHID_16

Conditions

Condition Prevalence

Treemap | Table

Search: liver cell

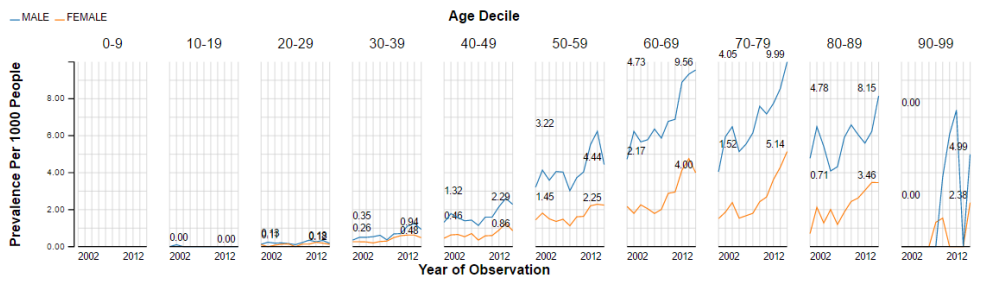
SOC	HLT	SNOMED	Person Count	Prevalence	Records per Person
NA	NA	Liver cell carcinoma	10,941	0.97%	8.74

Showing 1 to 1 of 1 entries (filtered from 5,989 total entries)

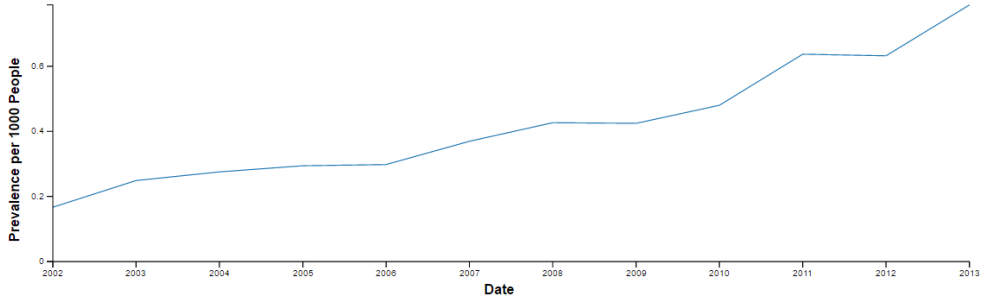
Previous 1 Next

Liver cell carcinoma

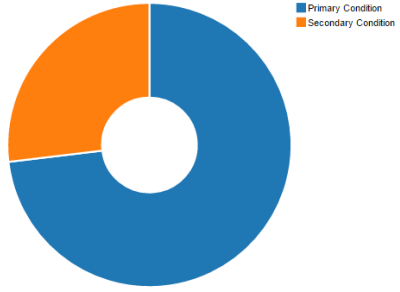
Condition Prevalence



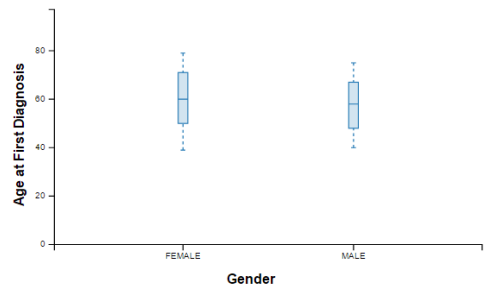
Condition Prevalence by Month



Conditions by Type

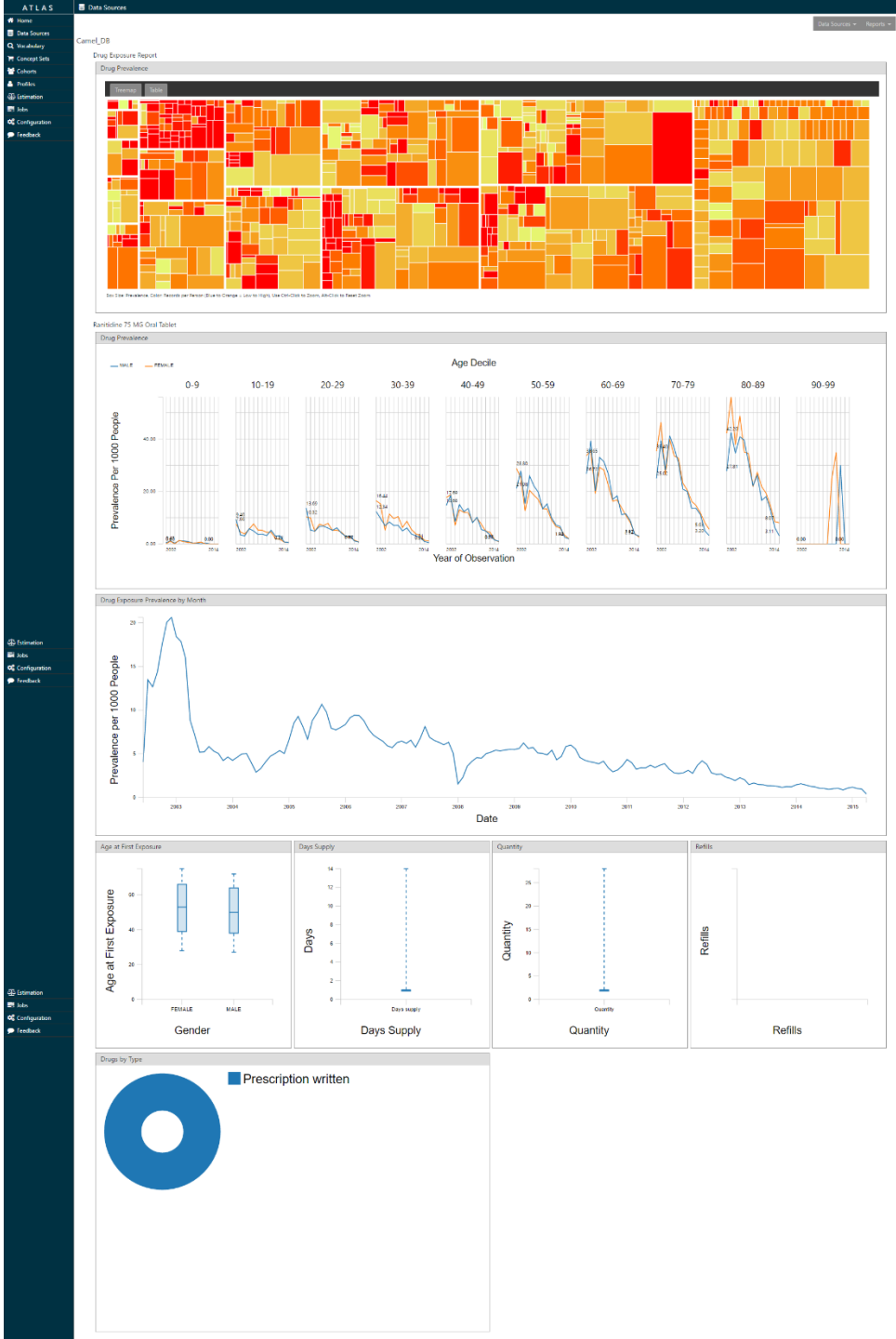


Age at First Diagnosis



아킬레스:
약물 검색

연령별, 시기별 트렌드 조회



Fluorouracil
아주대병원 230만명 22년 자료

Fluorouracil
보험공단 100만명 샘플 10년간 자료

Achilles

CAMEL (ver 16.050.010)

Drug Exposure Report

Drug Prevalence

Treemap | Table

Search: pyrimidine analogues | Show / hide columns

ATC 1	ATC 5	RxNorm	Person Count	Prevalence	Records per Person
ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS	Pyrimidine analogues	Fluorouracil 50 MG/ML Injectable Solution	6,049	0.27%	58.52
ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS	Pyrimidine analogues	Tegafur	1,999	0.09%	7.44
ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS	Pyrimidine analogues	capecitabine 500 MG Oral Tablet	1,468	0.07%	15.60
ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS	Pyrimidine analogues	gemcitabine	1,302	0.06%	28.93
ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS	Pyrimidine analogues	capecitabine 150 MG Oral Tablet	844	0.04%	13.41

Showing 1 to 5 of 8 entries (filtered from 1,784 total entries) Previous 1 2 Next

Fluorouracil 50 MG/ML Injectable Solution

Drug Prevalence

MALE FEMALE

Age Decile

0-9 10-19 20-29 30-39 40-49 50-59 60-69 70-79 80-89 90-99

Prevalence Per 1000 People

Year of Observation

Drug Exposure Prevalence by Month

Prevalence per 1000 People

Date

Age at First Exposure

Age at First Exposure

Gender

Days Supply

Days

Days Supply

Quantity

Quantity

Refills

Refills

Exposure Prevalence by Month

Date

Gender

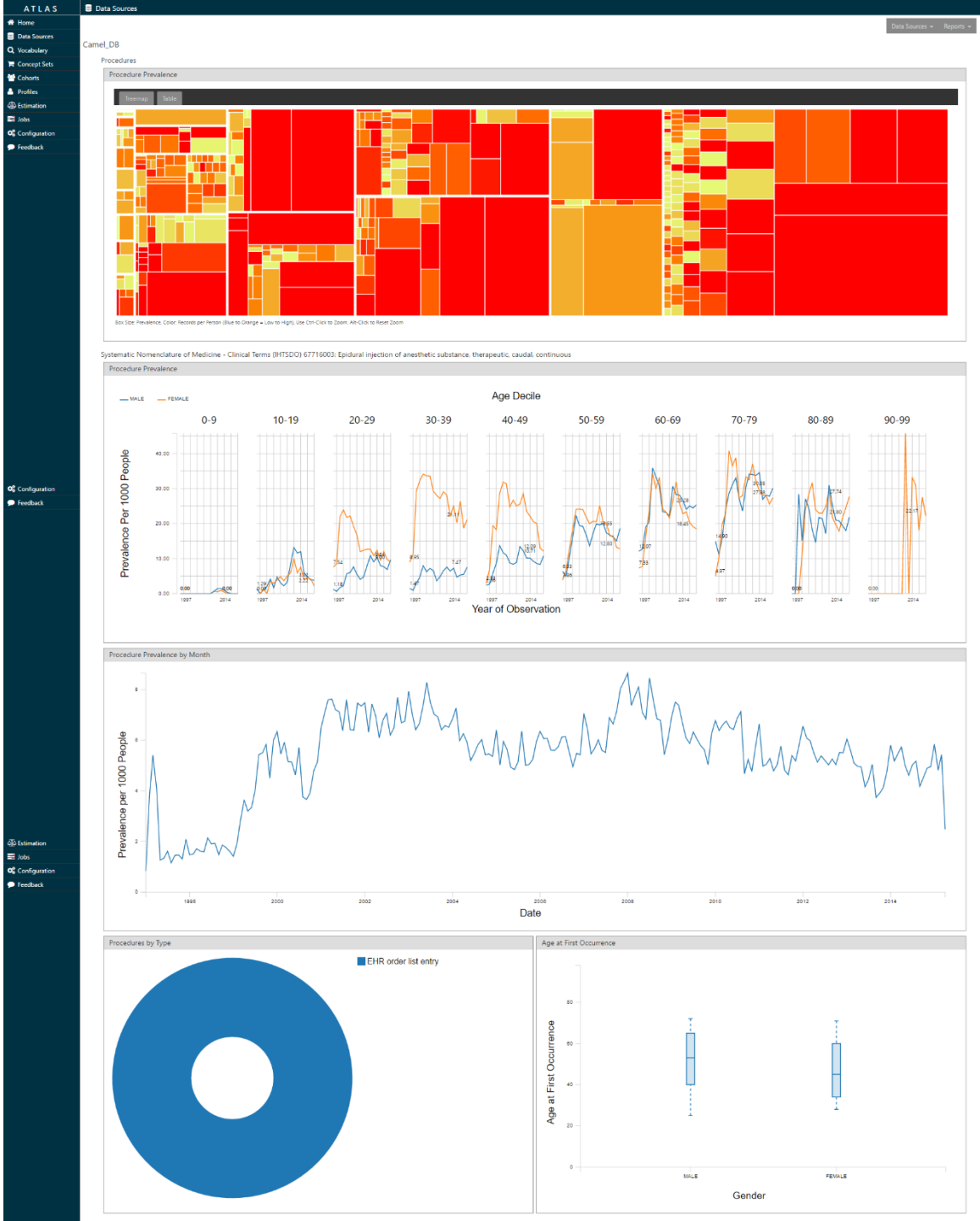
Days Supply

Quantity

Refills

아킬레스:
시술명 검색

연령별, 시기별 트렌드 조회



아킬레스:
검사결과 검색


ATLAS
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Measurement Prevalence
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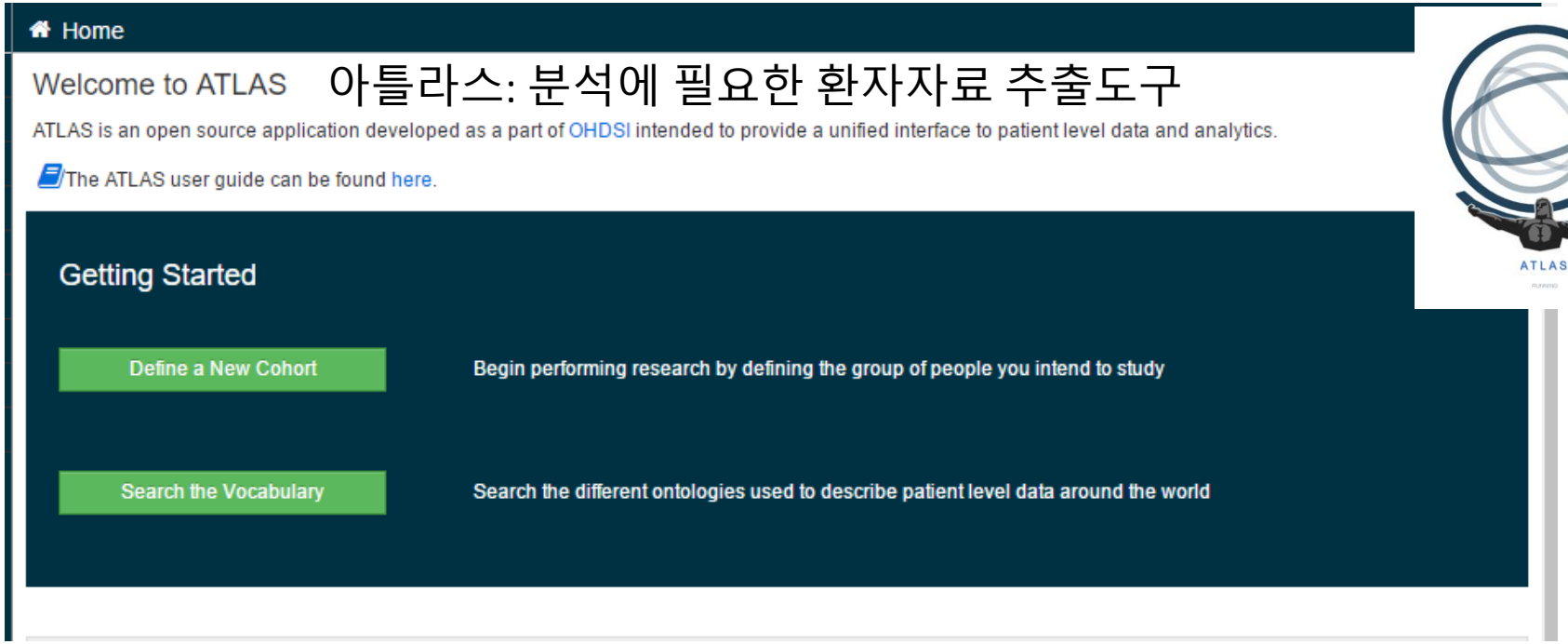
90-99
Prevalence Per 1000 People
Year of Measurement
Measurement Prevalence by Month
Prevalence per 1000 People
Date
Measurement by Type
Lab result
Age at First Occurrence
Age at First Occurrence
Gender
Measurement Records by Unit
gram per deciliter
Measurement Value Distribution
Measurement Value
Unit
Lower Limit Distribution
Measurement Value
Unit
Upper Limit Distribution
Measurement Value
Unit
Values Relative to Normal Range

오픈이노베이션: 프로그램 공동개발, 공동이용

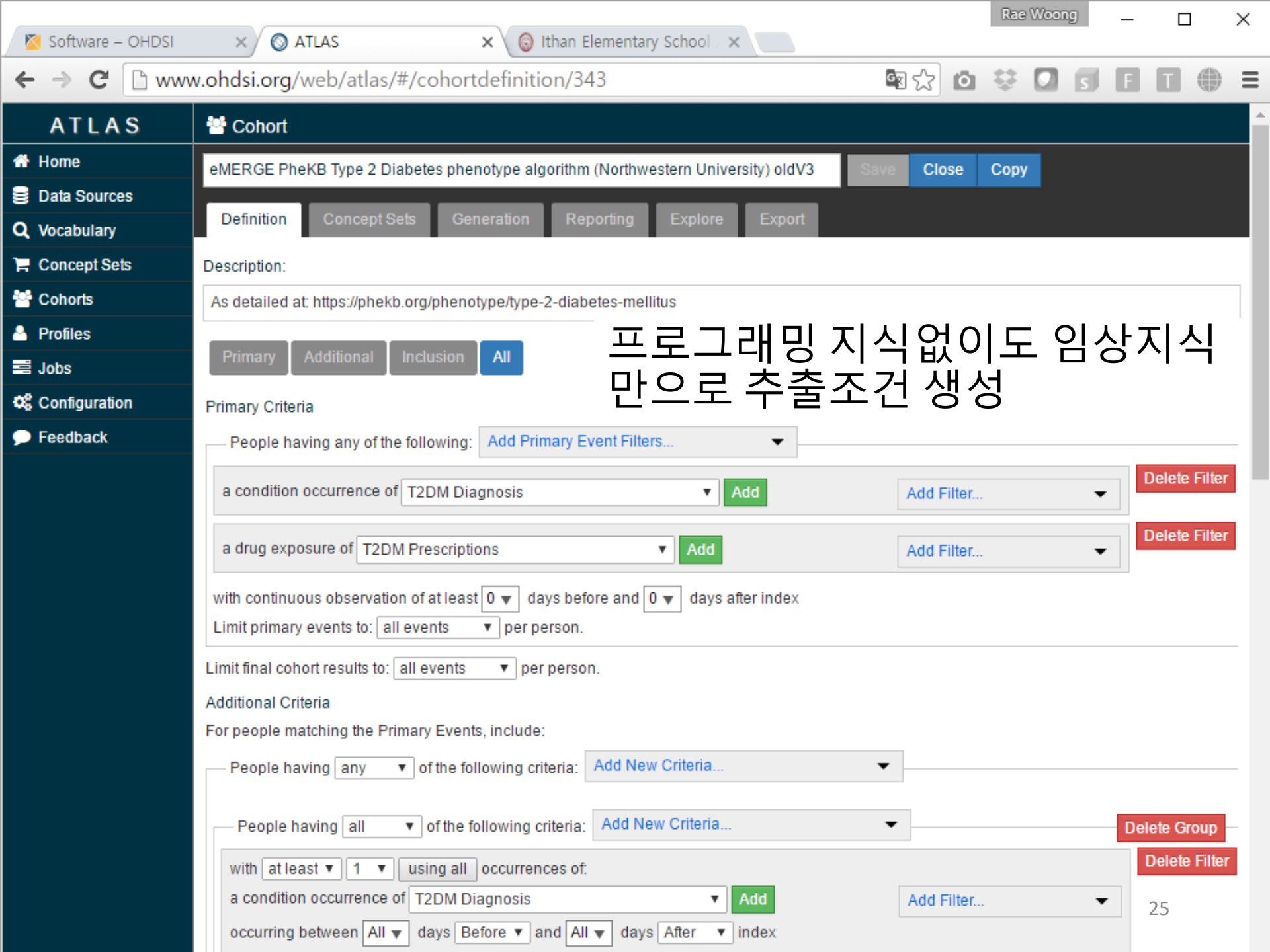


OHDSI 통합 분석 플랫폼
- OHDSI 주요 툴들이 취합된 통합 플랫폼
- CIRCE, HERMES, CALYPSO 등

코호트 추출 기능
- 코호트 선정 및 추출 가능
- 추출된 코호트의 시각화 가능

발병률 검색 기능
- 코호트 별 질병 발병률, 약물 복용자 수 등 조회 가능

분석 코드 생성 기능
- 의약품-부작용 간 관계 분석 코드 제공
- 성향점수매칭분석, 회귀분석 등 가능


Rae Woong
Software – OHDSI
ATLAS
Ithan Elementary School
www.ohdsi.org/web/atlas/#/cohortdefinition/343
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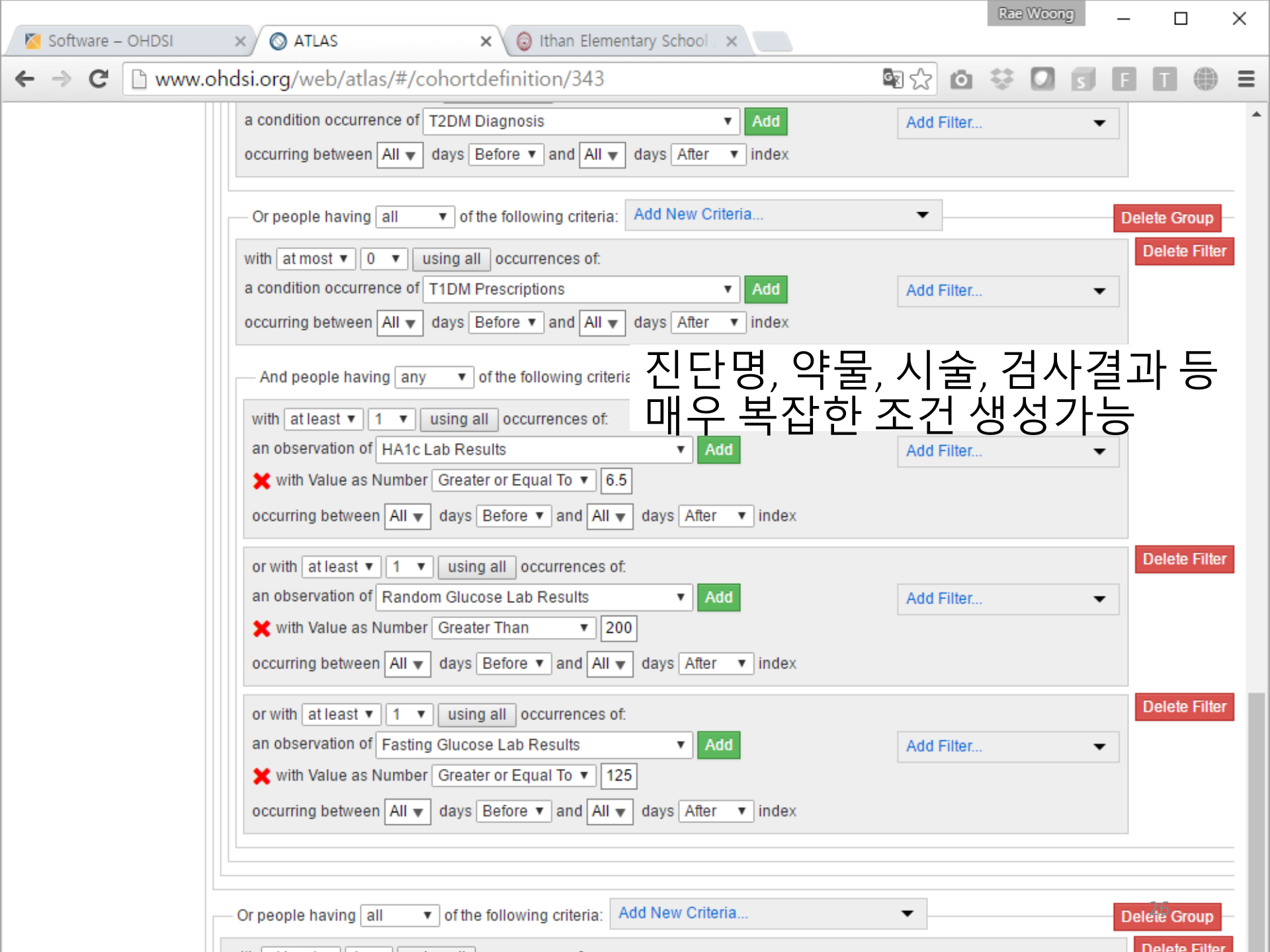
Description:
As detailed at: https://phekb.org/phenotype/type-2-diabetes-mellitus
Primary
Additional
Inclusion
All
프로그래밍 지식없이도 임상지식만으로 추출조건 생성
Primary Criteria
People having any of the following:
Add Primary Event Filters...
a condition occurrence of
T2DM Diagnosis
Add
Add Filter...
Delete Filter
a drug exposure of
T2DM Prescriptions
Add
Add Filter...
Delete Filter
with continuous observation of at least 0 days before and 0 days after index
Limit primary events to: all events per person.
Limit final cohort results to: all events per person.
Additional Criteria
For people matching the Primary Events, include:
People having any of the following criteria:
Add New Criteria...
People having all of the following criteria:
Add New Criteria...
Delete Group
with at least 1 using all occurrences of:
a condition occurrence of
T2DM Diagnosis
Add
Add Filter...
Delete Filter
occurring between All days Before and All days After index
25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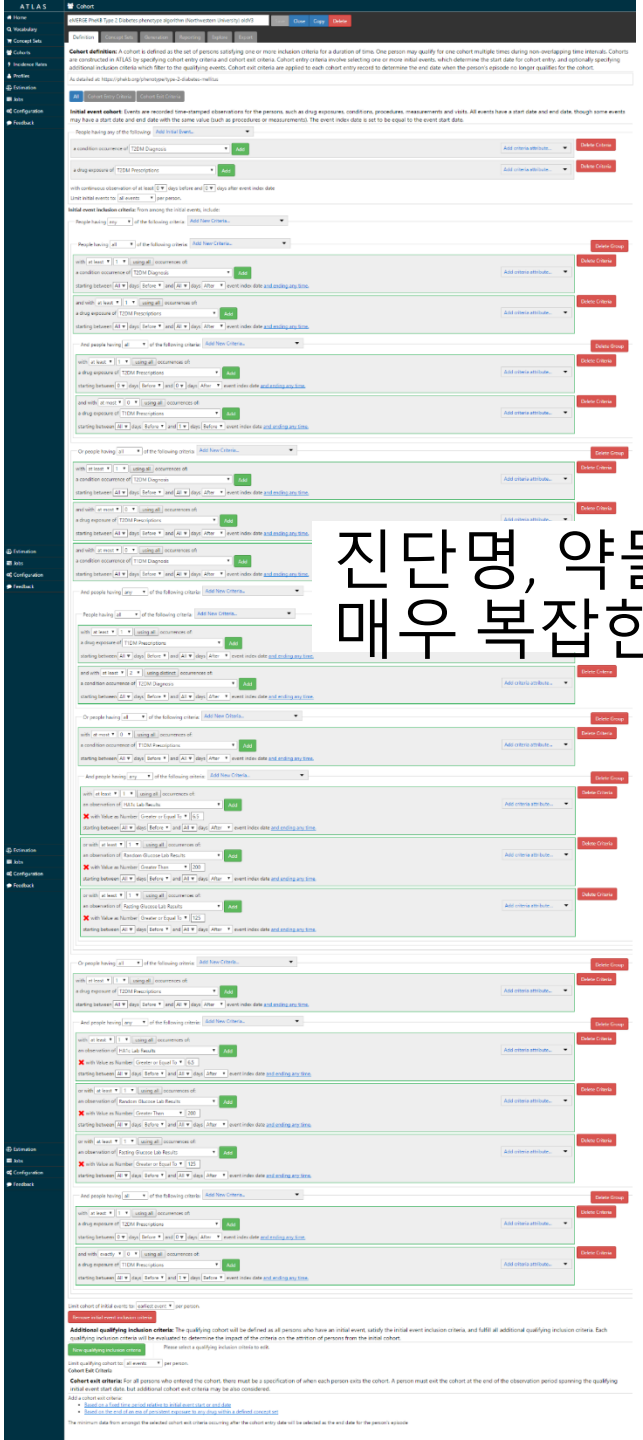
ATLAS
Ithan Elementary School
www.ohdsi.org/web/atlas/#/cohortdefinition/343
a condition occurrence of T2DM Diagnosis Add
Add Filter...
occurring between All days Before and All days After index
Or people having all of the following criteria: Add New Criteria...
Delete Group
Delete Filter
with at most 0 using all occurrences of:
a condition occurrence of T1DM Prescriptions Add
Add Filter...
occurring between All days Before and All days After index
And people having any of the following criteria
진단명, 약물, 시술, 검사결과 등
매우 복잡한 조건 생성가능
with at least 1 using all occurrences of:
an observation of HA1c Lab Results Add
Add Filter...
with Value as Number Greater or Equal To 6.5
occurring between All days Before and All days After index
or with at least 1 using all occurrences of:
an observation of Random Glucose Lab Results Add
Add Filter...
with Value as Number Greater Than 200
occurring between All days Before and All days After index
Delete Filter
or with at least 1 using all occurrences of:
an observation of Fasting Glucose Lab Results Add
Add Filter...
with Value as Number Greater or Equal To 125
occurring between All days Before and All days After index
Delete Filter
Or people having all of the following criteria: Add New Criteria...
Delete Group
Delete Filter
26



진단명, 약물, 시술, 검사결과 등
매우 복잡한 조건 생성가능

아틀라스: 분석에 필요한 환자 추출도구

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eMERGE PheKB Type 2 Diabetes phenotype algorithm (Northwestern University) oldV3 | Save | Close | Copy

Definition | Concept Sets | Generation | Reporting | Explore | Export

Print Friendly | JSON | SQL

환자추출 조건 요약 기능

People having any of the following:

- a condition occurrence of T2DM Diagnosis[6]
- a drug exposure of T2DM Prescriptions[7]

with continuous observation of at least 0 days prior and 0 days after index, and limit primary events to: **all events per person.**

For people matching the Primary Events, include:
People having any of the following criteria:

- People having all of the following criteria:
  - at least 1 occurrences of a condition occurrence of T2DM Diagnosis[6] occurring between all days Before and all days After index
  - and at least 1 occurrences of a drug exposure of T2DM Prescriptions[7] occurring between all days Before and all days After index
  - And people having all of the following criteria:
    - at least 1 occurrences of a drug exposure of T2DM Prescriptions[7] occurring between 0 days Before and 0 days After index
    - and at most 0 occurrences of a drug exposure of T1DM Prescriptions[5] occurring between all days Before and 1 days Before index
- Or people having all of the following criteria:
  - at least 1 occurrences of a condition occurrence of T2DM Diagnosis[6] occurring between all days Before and all days After index
  - and at most 0 occurrences of a drug exposure of T2DM Prescriptions[7] occurring between all days Before and all days After index
  - and at most 0 occurrences of a condition occurrence of T1DM Diagnosis[4] occurring between all days Before and all days After index
  - And people having any of the following criteria:
    - People having all of the following criteria:
      - at least 1 occurrences of a drug exposure of T1DM Prescriptions[5] occurring between all days Before and all days After index
      - and at least 2 distinct occurrences of a condition occurrence of T2DM Diagnosis[6] occurring between all days Before and all days After index
    - Or people having all of the following criteria:
      - at most 0 occurrences of a condition occurrence of T1DM Prescriptions[5] occurring between all days Before and all days After index
      - And people having any of the following criteria:
        - at least 1 occurrences of an observation of HA1c Lab Results[2]
          - with value as number >= 6.5

          occurring between all days Before and all days After index
        - or at least 1 occurrences of an observation of Random Glucose Lab Results[3]
          - with value as number > 200

          occurring between all days Before and all days After index
        - or at least 1 occurrences of an observation of Fasting Glucose Lab Results[1]
          - with value as number >= 125

          occurring between all days Before and all days After index
- Or people having all of the following criteria:
  - at least 1 occurrences of a drug exposure of T2DM Prescriptions[7] occurring between all days Before and all days After index
  - And people having any of the following criteria:
    - at least 1 occurrences of an observation of HA1c Lab Results[2]
      - with value as number >= 6.5

      occurring between all days Before and all days After index
    - or at least 1 occurrences of an observation of Random Glucose Lab Results[3]
      - with value as number > 200

      occurring between all days Before and all days After index
    - or at least 1 occurrences of an observation of Fasting Glucose Lab Results[1]
      - with value as number >= 125

      occurring between all days Before and all days After index
  - And people having all of the following criteria:
    - at least 1 occurrences of a drug exposure of T2DM Prescriptions[7] occurring between 0 days Before and 0 days After index
    - and exactly 0 occurrences of a drug exposure of T1DM Prescriptions[5] occurring between all days Before and 1 days Before index

Limit cohort expression results to: **all events per person.**

Appendix 1: Concept Set Definitions

1. Fasting Glucose Lab Results

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
3037110	Fasting glucose [Mass/volume] in Serum or Plasma	Measurement	LOINC	NO	YES	NO

2. HA1c Lab Results

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
3004410	Hemoglobin A1c (Glycated)	Measurement	LOINC	NO	YES	NO
3005673	Hemoglobin A1c/Hemoglobin.total in Blood by HPLC	Measurement	LOINC	NO	YES	NO
3003309	Hemoglobin A1c/Hemoglobin.total in Blood by Electrophoresis	Measurement	LOINC	NO	YES	NO
3007263	Hemoglobin A1c/Hemoglobin.total in Blood by calculation	Measurement	LOINC	NO	YES	NO

3. Random Glucose Lab Results

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
3000483	Glucose [Mass/volume] in Blood	Measurement	LOINC	NO	YES	NO
3004501	Glucose lab	Measurement	LOINC	NO	YES	NO

4. T1DM Diagnosis

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
201254	Type 1 diabetes mellitus	Condition	SNOMED	NO	YES	NO

5. T1DM Prescriptions

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
19122121	Insulin	Drug	RxNorm	NO	YES	NO
4285892	Insulin	Drug	SNOMED	NO	YES	NO
1517998	Pramlintide	Drug	RxNorm	NO	YES	NO

6. T2DM Diagnosis

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
201826	Type 2 diabetes mellitus	Condition	SNOMED	NO	YES	NO

7. T2DM Prescriptions

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped
1530014	Acetohexamide	Drug	RxNorm	NO	YES	NO
1597756	glimepiride	Drug	RxNorm	NO	YES	NO
1502809	Tolazamide	Drug	RxNorm	NO	YES	NO
1594973	Chlorpropamide	Drug	RxNorm	NO	YES	NO
1560171	Glipizide	Drug	RxNorm	NO	YES	NO
1559684	Glyburide	Drug	RxNorm	NO	YES	NO
1516766	repaglinide	Drug	RxNorm	NO	YES	NO
1502826	nateglinide	Drug	RxNorm	NO	YES	NO
1503297	Metformin	Drug	RxNorm	NO	YES	NO
1547504	rosiglitazone	Drug	RxNorm	NO	YES	NO
1525215	pioglitazone	Drug	RxNorm	NO	YES	NO
1515249	troglitazone	Drug	RxNorm	NO	YES	NO
1529331	Acarbose	Drug	RxNorm	NO	YES	NO
1510202	miglitol	Drug	RxNorm	NO	YES	NO
1580747	sitagliptin	Drug	RxNorm	NO	YES	NO
1583722	exenatide	Drug	RxNorm	NO	YES	NO

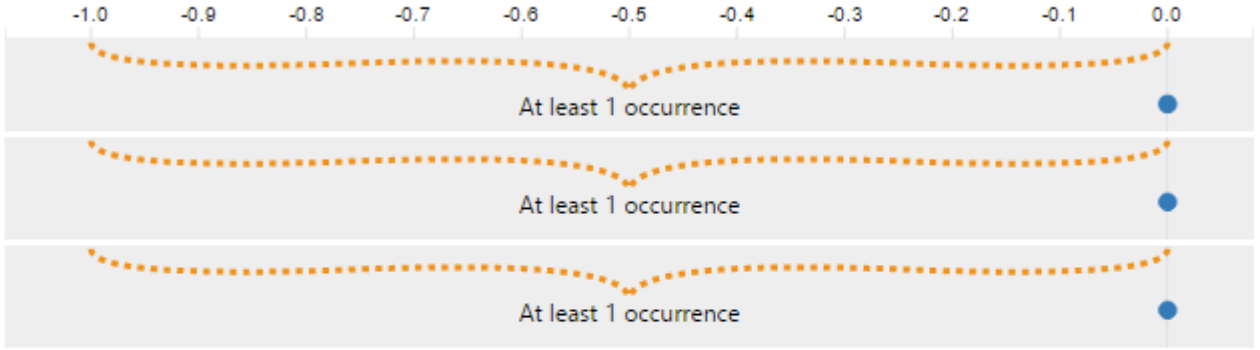
8. Unnamed Concept Set

Concept Id	Concept Name	Domain	Vocabulary	Excluded	Descendants	Mapped

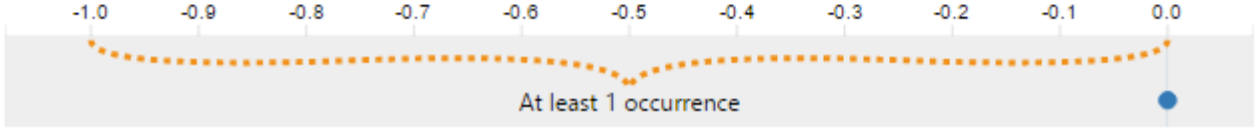
환자추출 조건 요약

시각화 요약기능

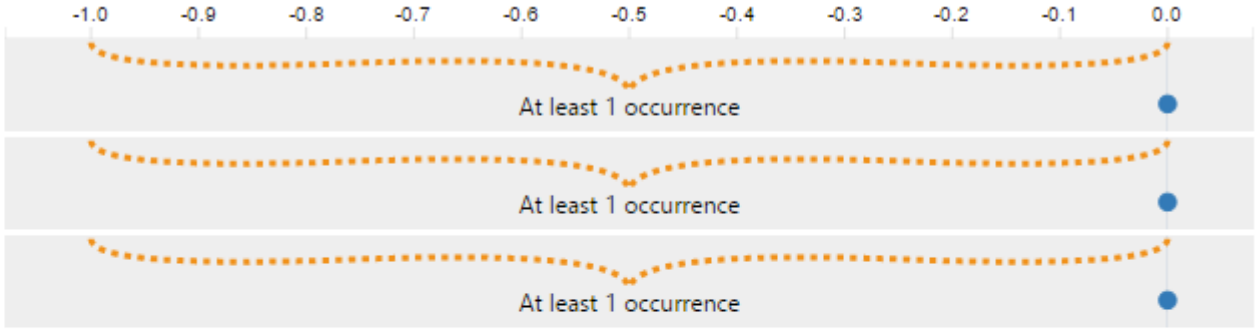
and Restrict to people having events matching any of the following criteria. Events must start within bracketed period ( ) relative to index date. Lines and arrows represent required duration of these events.



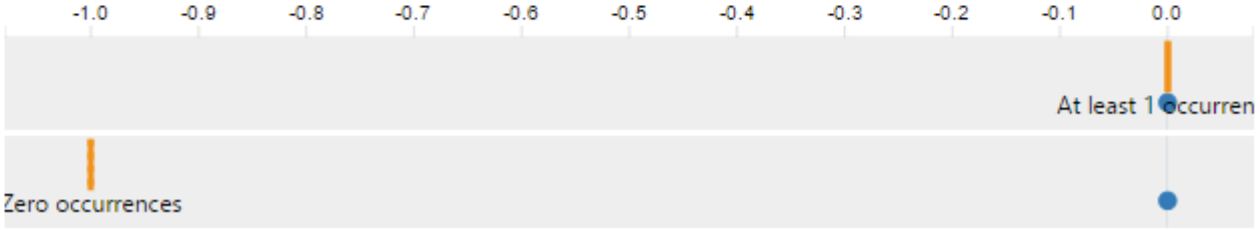
or Restrict to people having events matching all of the following criteria. Events must start within bracketed period ( ) relative to index date. Lines and arrows represent required duration of these events.



and Restrict to people having events matching any of the following criteria. Events must start within bracketed period ( ) relative to index date. Lines and arrows represent required duration of these events.



and Restrict to people having events matching all of the following criteria. Events must start within bracketed period ( ) relative to index date. Lines and arrows represent required duration of these events.



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MSSQL Server | MS APS | Oracle | PostgreSQL | Amazon Red Shift

분석에 필요한 환자추출

프로그램 코드 자동 생성

```
CREATE TABLE #Codesets (
  codeset_id int NOT NULL,
  concept_id bigint NOT NULL
)
;

INSERT INTO #Codesets (codeset_id, concept_id)
SELECT 0 as codeset_id, c.concept_id FROM (select distinct I.concept_id FROM
(
  select concept_id from @cdm_database_schema.CONCEPT where concept_id in (201254)and invalid_reason is null
UNION  select c.concept_id
  from @cdm_database_schema.CONCEPT c
  join @cdm_database_schema.CONCEPT_ANCESTOR ca on c.concept_id = ca.descendant_concept_id
  and ca.ancestor_concept_id in (201254)
  and c.invalid_reason is null

) I
) C;
INSERT INTO #Codesets (codeset_id, concept_id)
SELECT 1 as codeset_id, c.concept_id FROM (select distinct I.concept_id FROM
(
  select concept_id from @cdm_database_schema.CONCEPT where concept_id in (201826)and invalid_reason is null
UNION  select c.concept_id
  from @cdm_database_schema.CONCEPT c
  join @cdm_database_schema.CONCEPT_ANCESTOR ca on c.concept_id = ca.descendant_concept_id
  and ca.ancestor_concept_id in (201826)
  and c.invalid_reason is null

) I
```

> 1000줄

원하는 분석에 필요한 데이터를 뽑는 프로그램 코드를 자동 생성

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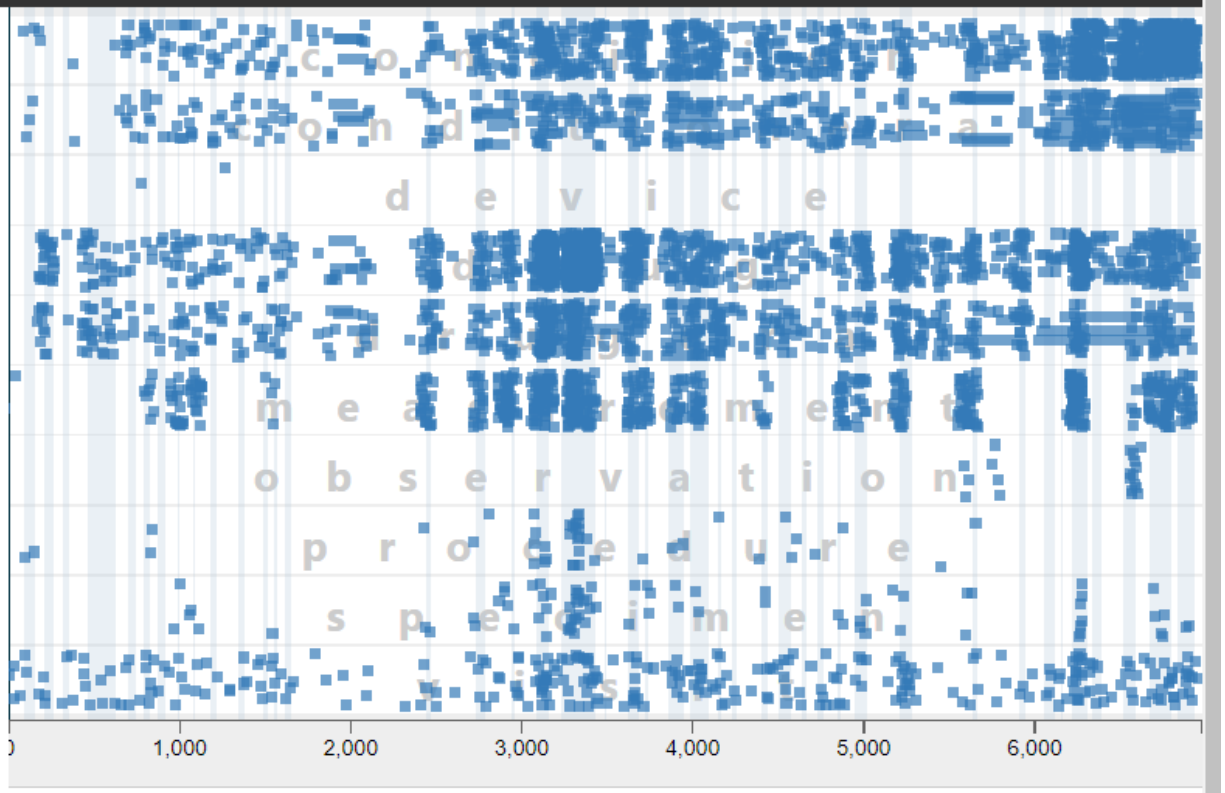
Camel_DB | 0001

FEMALE | 4349 events | Age 56 at index

Headache (69)
Spinal stenosis (68)
Menopausal syndrome (67)
Triazolam 0.25 MG Oral Tablet (64)
Zolpidem tartrate 10 MG Oral Tablet (55)
Idiopathic peripheral autonomic neuropathy (48)
Irritable bowel syndrome (47)
Steatosis of liver (47)
Gastric ulcer without hemorrhage, without perforation AND without obstruction (43)
Menopausal and postmenopausal disorders (41)
Gastroduodenitis (40)
Other drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD) (39)
Sleep disorder (39)
Amnesia (38)
Serum specimen (38)
Gastroesophageal reflux disease without esophagitis (36)
Labyrinthine disorder (36)
Zolpidem tartrate 12.5 MG Extended Release Oral Tablet (35)
Metabolic disease (34)



Column visibility | Copy | CSV | Show 15 entries | Filter:

Showing 1 to 15 of 4,349 entries | Previous 1 2 3 4 5 ... 290 Next

Domain
conditionera (365)
device (2)
drug (1268)
drugera (640)

Domain	Concept Id	Concept Name	Start Day	End Day
measurement	4092020	PR interval duration	0	0
measurement	4216826	QT interval feature	0	0
measurement	4218048	QRS interval	0	0
visit	9202	Outpatient Visit	0	0
visit	9202	Outpatient Visit	2	2
visit	9202	Outpatient Visit	3	3

Headache (69)
Spinal stenosis (68)
Menopausal syndrome (67)
Triazolam 0.25 MG Oral Tablet (64)
Zolpidem tartrate 10 MG Oral Tablet (55)
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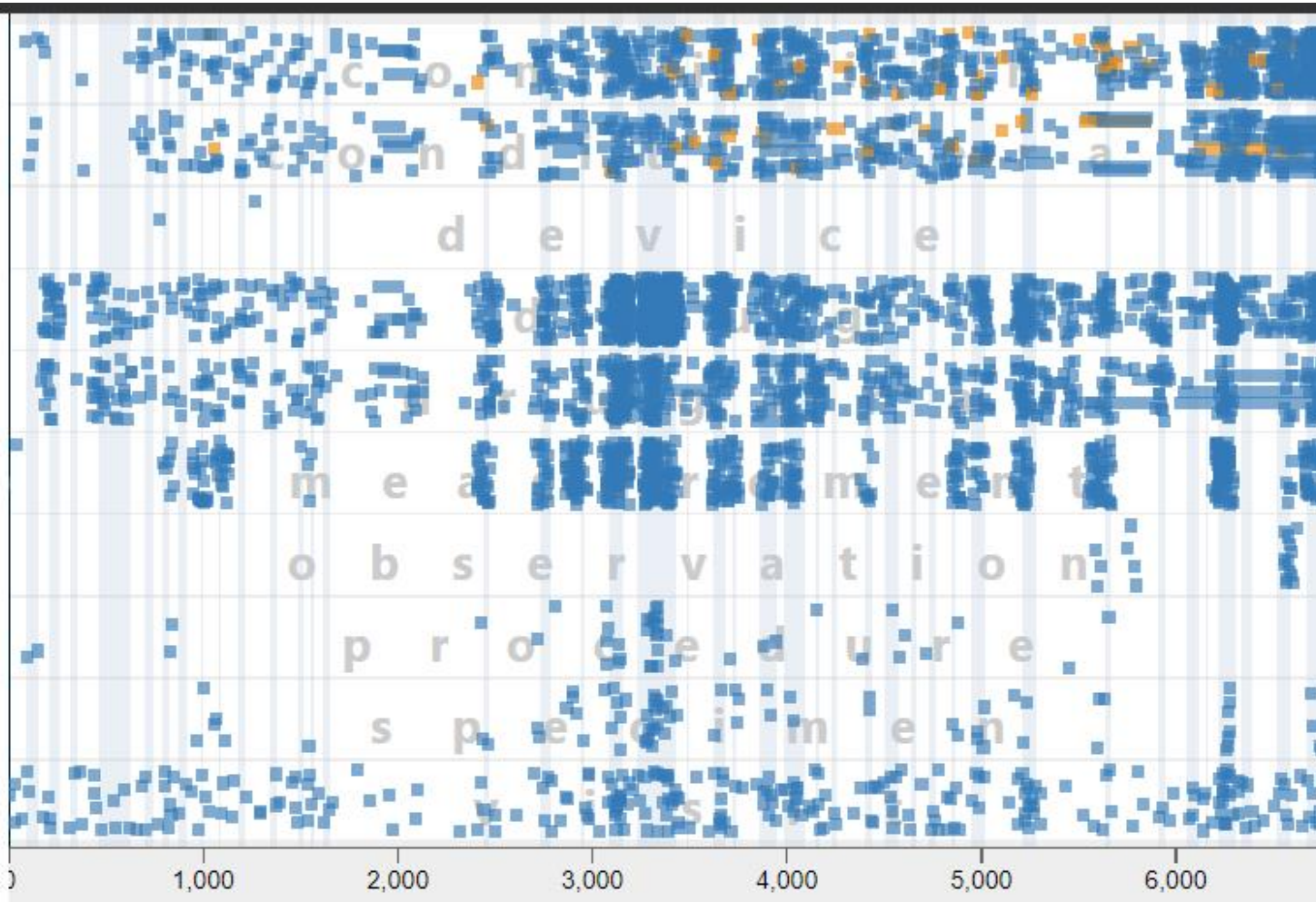

Column visibility | Copy | CSV | Show 15 ▼ entries | Filter:

Showing 1 to 15 of 4,349 entries

Previous 1 2 3 4 5 … 290 N

- Headache (69)
- Spinal stenosis (68)
- Menopausal syndrome (67)
- Triazolam 0.25 MG Oral Tablet (64)
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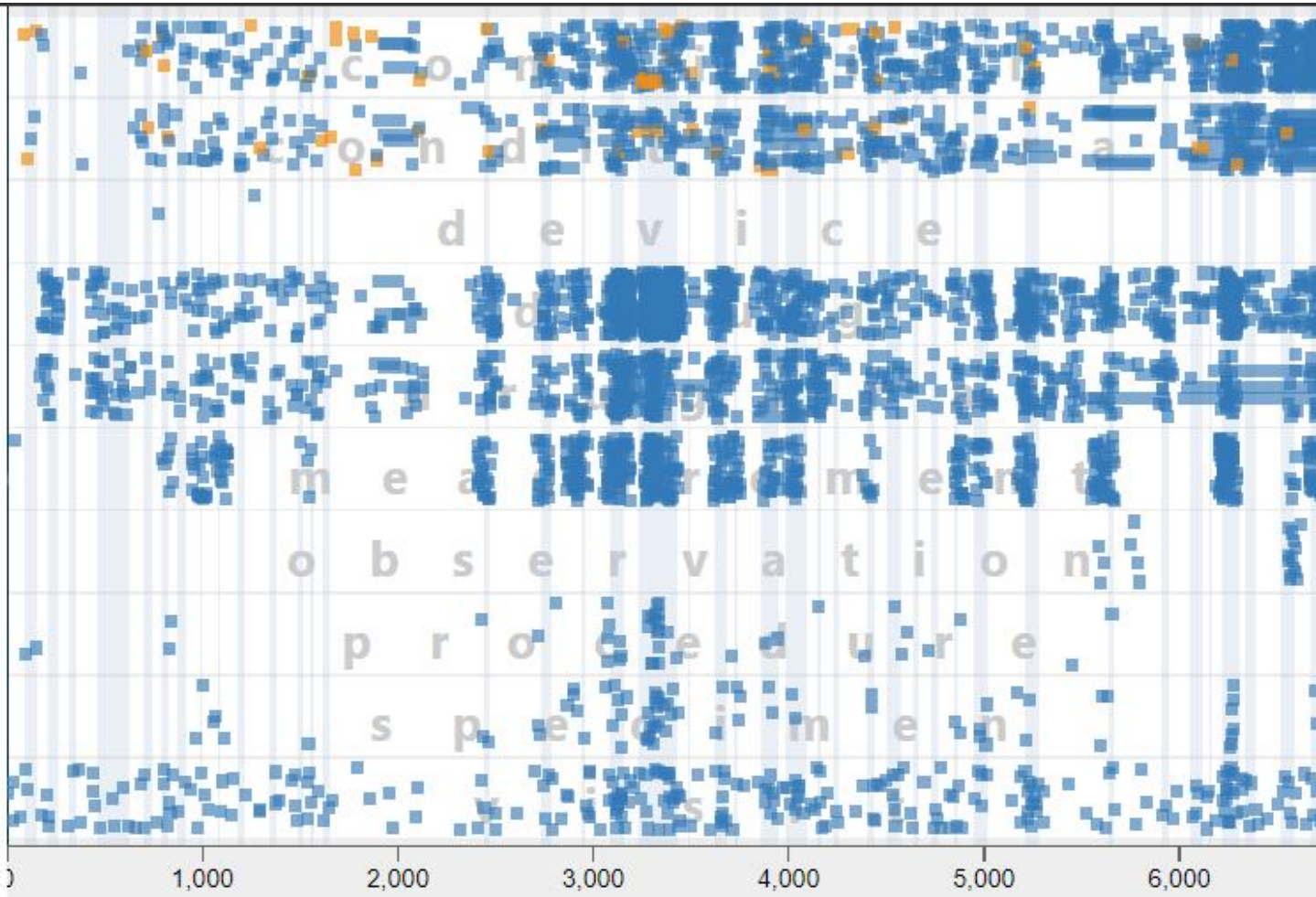
- Labyrinthine disorder (36)
- Zolpidem tartrate 12.5 MG Extended Release Oral Tablet (35)
- Metabolic disease (34)



Column visibility | Copy | CSV | Show 15 entries | Filter:

Showing 1 to 15 of 4,349 entries

Previous 1 2 3 4 5 ... 290

Headache (69)

Spinal stenosis (68)

Menopausal syndrome (67)

Triazolam 0.25 MG Oral Tablet (64)

Zolpidem tartrate 10 MG Oral Tablet (55)

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Gastric ulcer without hemorrhage, without perforation AND without obstruction (43)

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Other drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD) (39)

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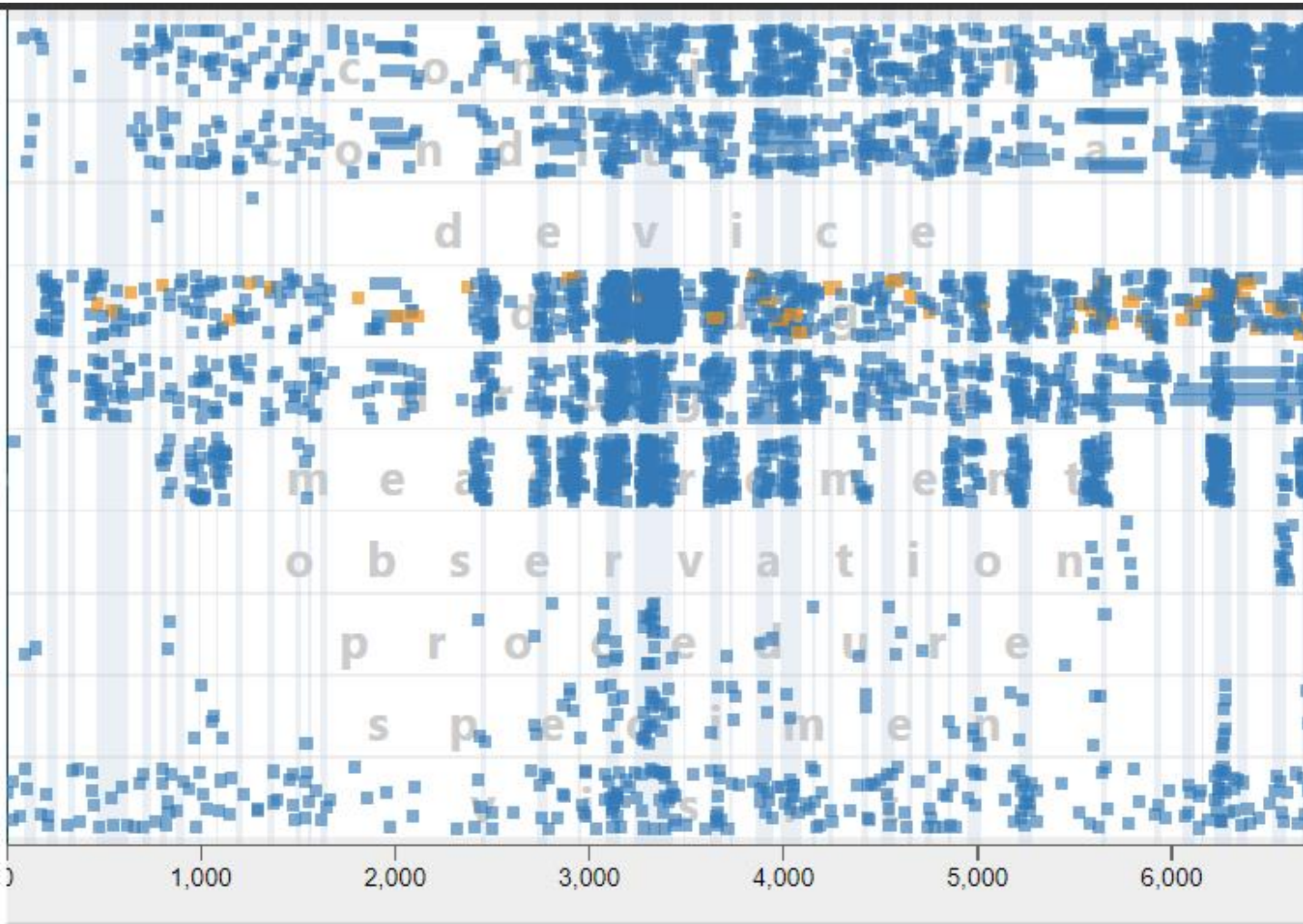
Gastroesophageal reflux disease without esophagitis (36)

Labyrinthine disorder (36)

Zolpidem tartrate 12.5 MG Extended Release Oral Tablet (35)

Metabolic disease (34)

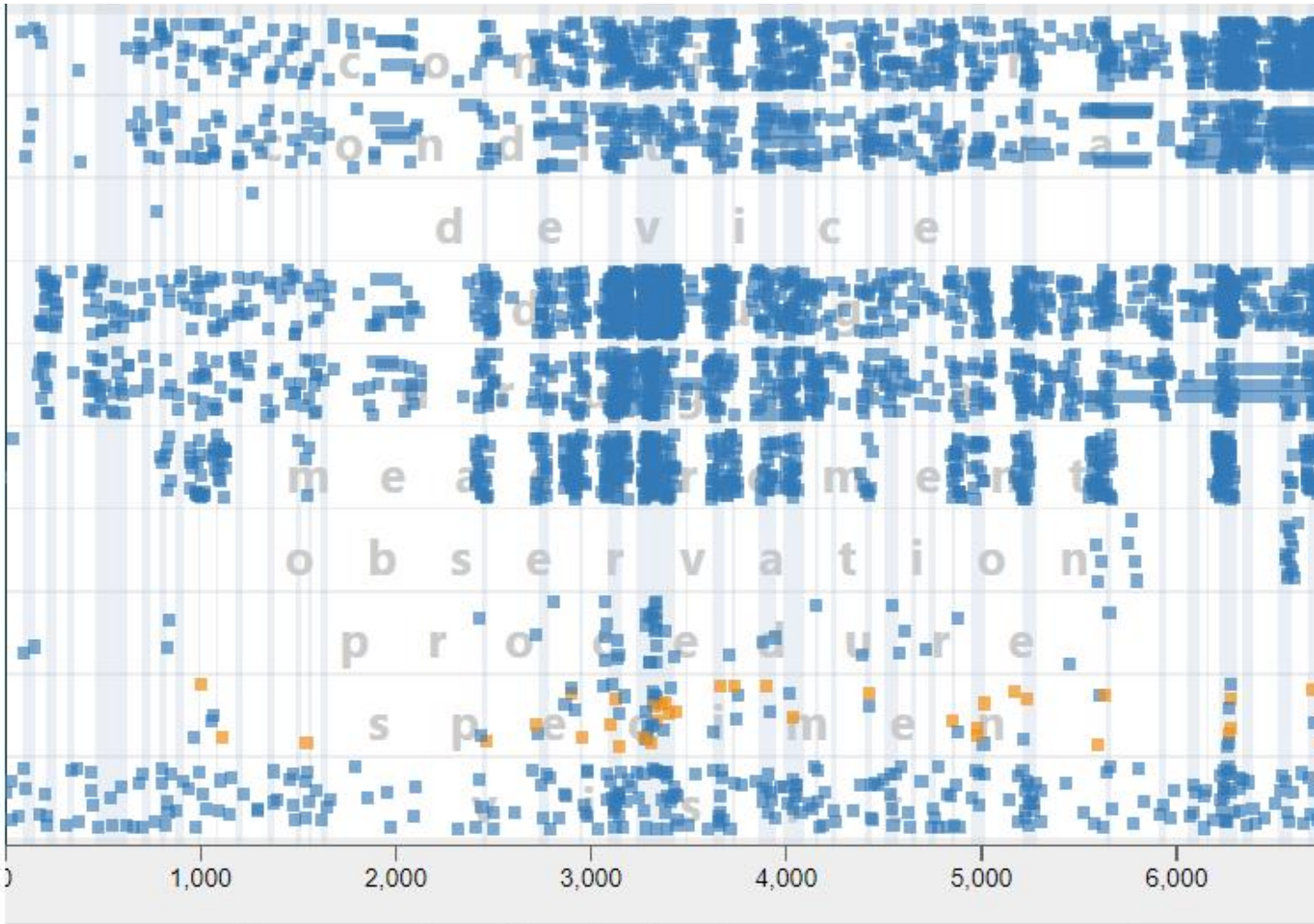


Column visibility | Copy | CSV | Show 15 entries | Filter:

Showing 1 to 15 of 4,349 entries

Previous 1 2 3 4 5 ... 290

- Headache (69)
- Spinal stenosis (68)
- Menopausal syndrome (67)
- Triazolam 0.25 MG Oral Tablet (64)
- Zolpidem tartrate 10 MG Oral Tablet (55)
- Idiopathic peripheral autonomic neuropathy (48)
- Irritable bowel syndrome (47)
- Steatosis of liver (47)
- Gastric ulcer without hemorrhage, without perforation AND without obstruction (43)
- Menopausal and postmenopausal disorders (41)
- Gastroduodenitis (40)
- Other drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD) (39)
- Sleep disorder (39)
- Amnesia (38)
- Serum specimen (38)
- Gastroesophageal reflux disease without esophagitis (36)
- Labyrinthine disorder (36)
- Zolpidem tartrate 12.5 MG Extended Release Oral Tablet (35)
- Metabolic disease (34)



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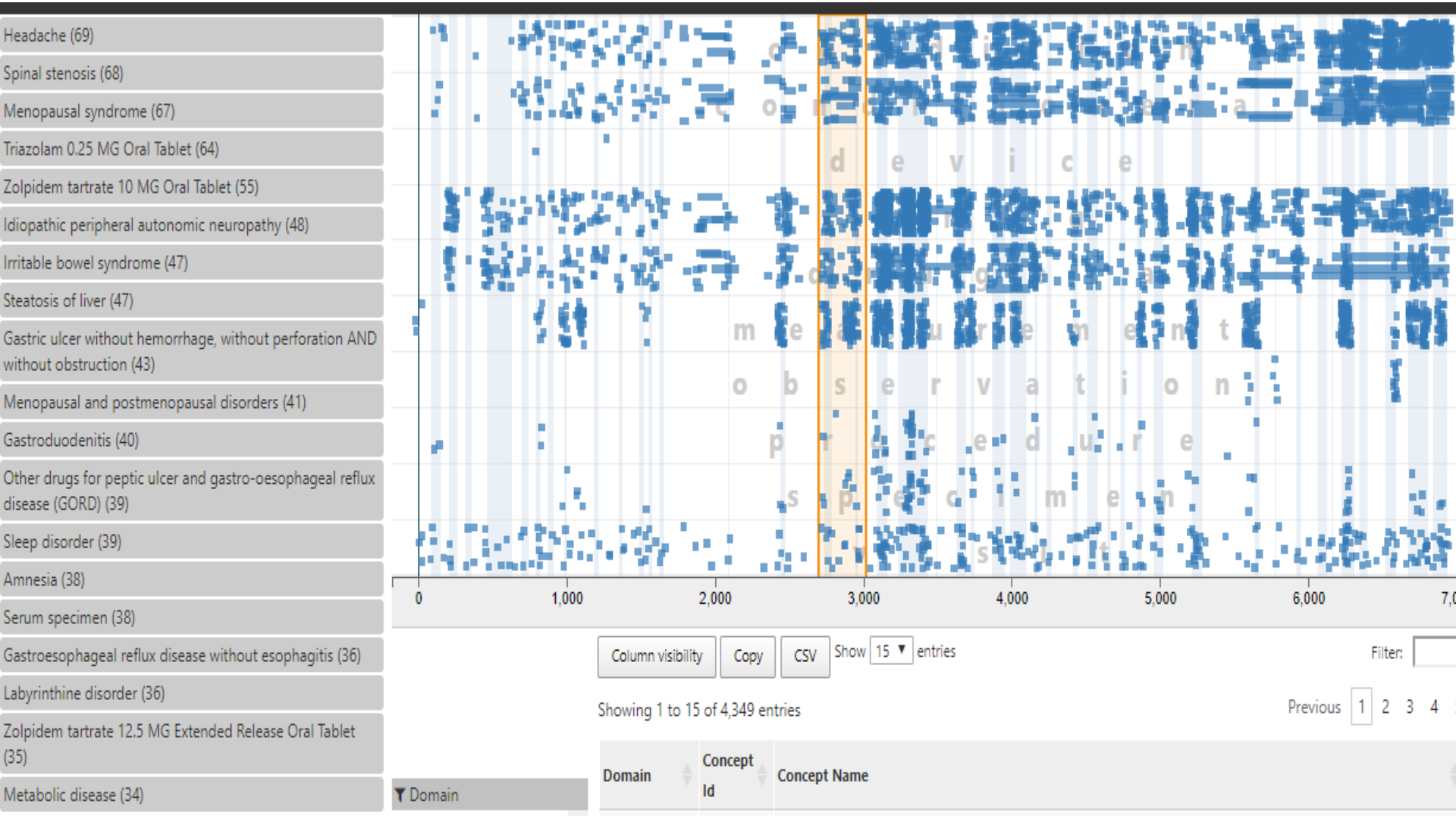
Headache (69)
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Zolpidem tartrate 12.5 MG Extended Release Oral Tablet (35)
Metabolic disease (34)
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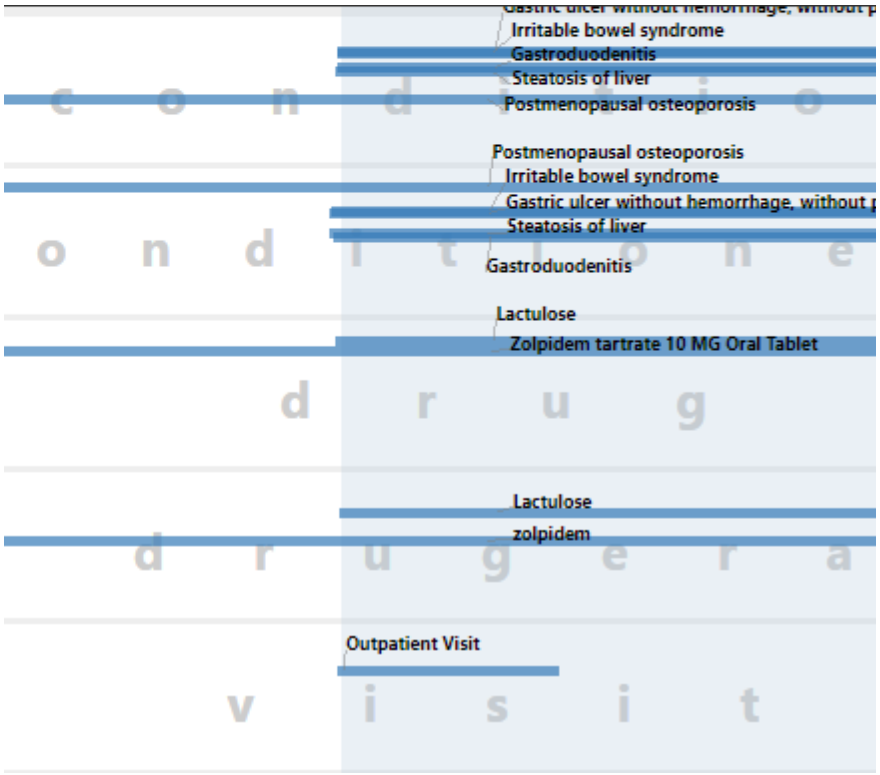
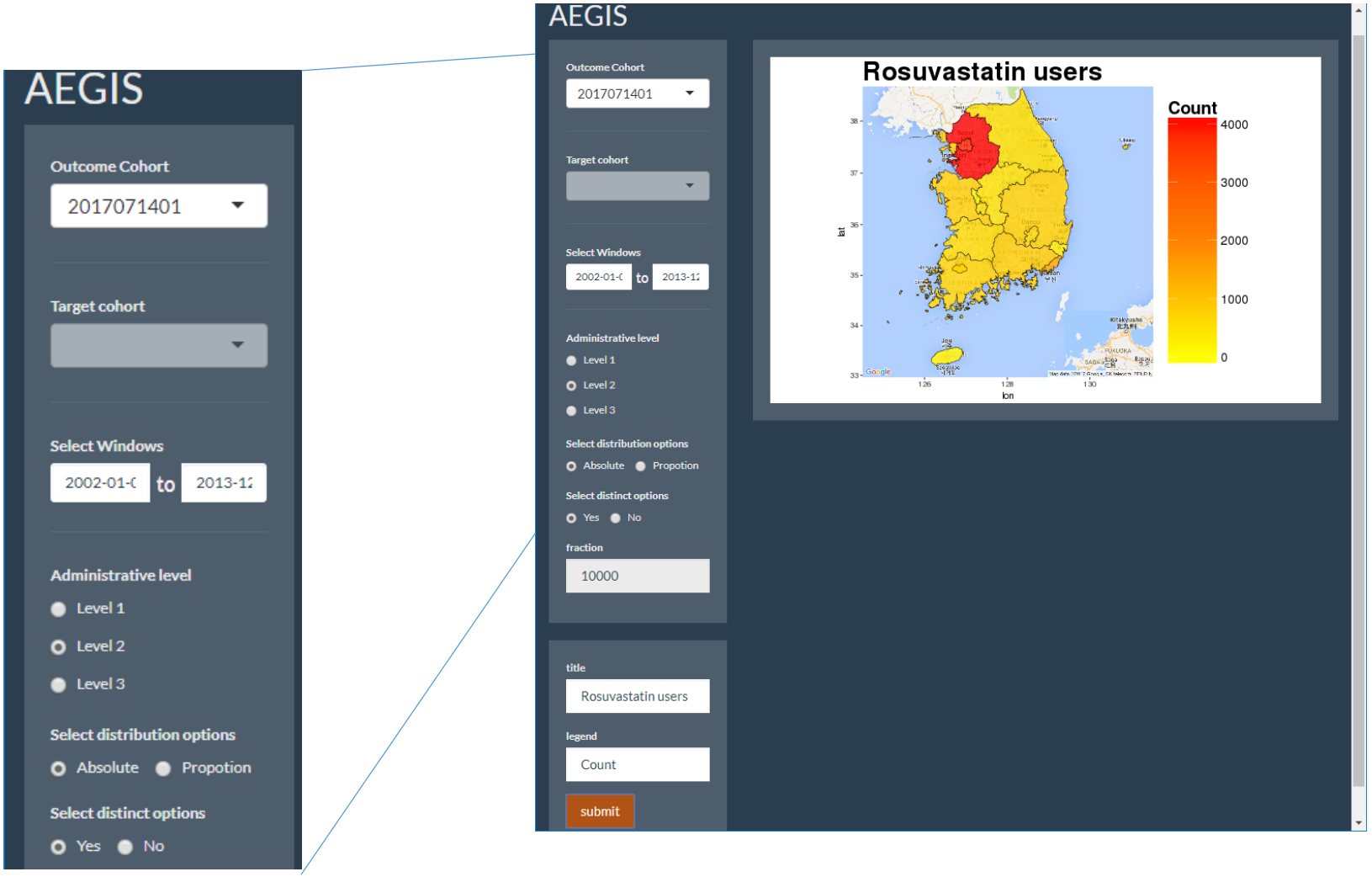

Irritable bowel syndrome
Gastroduodenitis
Steatosis of liver
Postmenopausal osteoporosis
condition
Postmenopausal osteoporosis
Irritable bowel syndrome
Gastric ulcer without hemorrhage, without
Steatosis of liver
Gastroduodenitis
condition
Lactulose
Zolpidem tartrate 10 MG Oral Tablet
drug
Lactulose
zolpidem
drug era
Outpatient Visit
visit

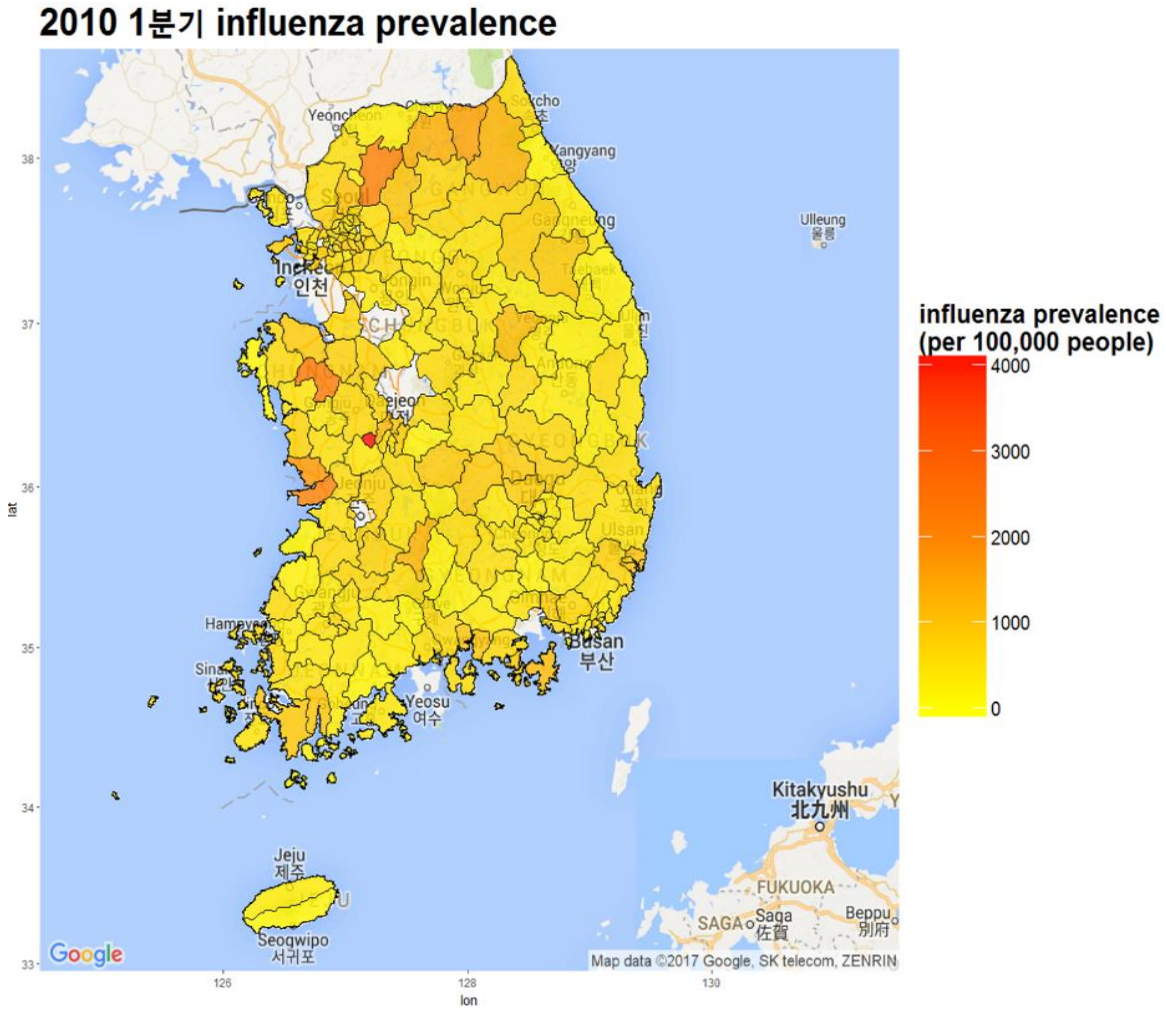
Application for **E**pidemiological **G**eographic **I**nformation **S**ystem (**AEGIS**)

Contributors: Jaehyeong Cho, Seng Chan You, Kyehwon Kim, Min-seok Jeon, Rae Woong Park

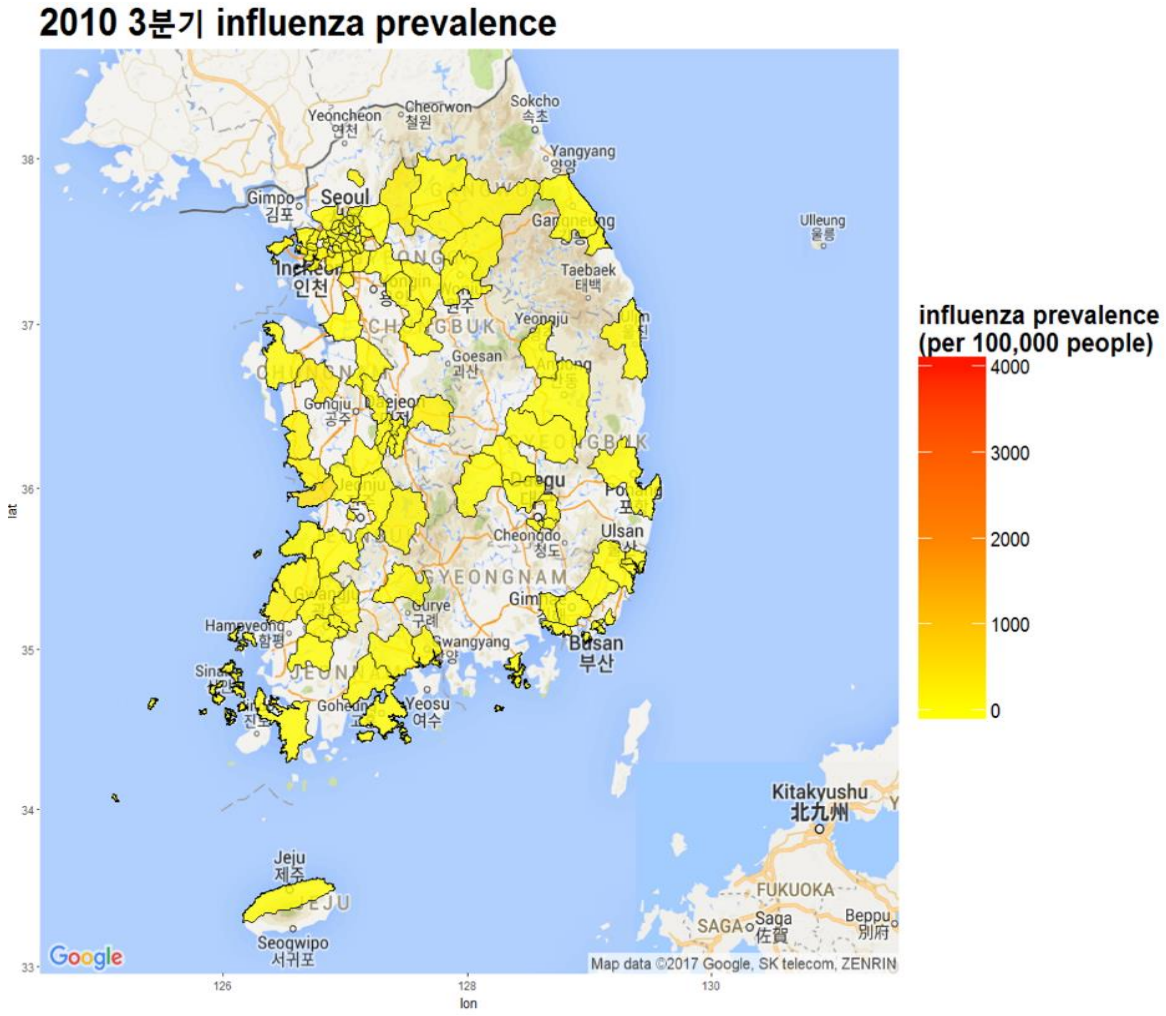
Utilization of AEGIS UI



CDM기반 지리정보시스템



CDM기반 지리정보시스템




OHDSI 207, Bethesda, USA, Oct 17-20, 2017
OHDSI
VOTE FOR BEST CONTRIBUTION HERE:

Korean OHDSI network: 18

CDM Conversion Status

- Conversion completed: 4 institutions
  - Ajou University Hospital: 2.3M, 23 years EHR
  - Gachun Gil University Hospital: 2M, 10 years EHR
  - Kangwon National University Hospital: 0.5M, 10 years EHR
  - NHIS: 2M, 12 years, Claim + regular health exam (2018: 51M, 12 years)
- Conversion in progress 14 institutions
  - ➢ **By the end of 2017: 2**
  - Samsung Medical Center
  - Wonkwang University Hospital
  - Wonju Severance Hospital
  - ➢ **By the end of 2018: 14**
  - Chonbuk National University Hospital
  - Yonsei Unviersity Severance Hospital
  - Korea University Anam Hosital
  - Korea University Guro Hospital
  - Korea University Ansan Hospital
  - Gangdong Sacred Heart Hospital
  - Hanyang University Hospital
  - Ehwa Unviersity Mokdong Hospital
  - Ehwa Unviersity Magok Hospital
  - Cha University Hospital

<MOU>

Activity in Korea

- Leadership meeting
  - Bimonthly
  - Leaders in charge of CDM for each hospital
  - Important decisions and policy-related issues
- Engineer meeting
  - Biweekly, TC (current 9th)
  - EHR experts from participating hospitals
  - Discuss all the technical issues during CDM conversion

Activity in Korea

- Open forum
  - Monthly, 3 hour lecture
  - Agenda
    - Introduction to OHDSI and CDM
    - OMOP CDM Structure
    - OMOP CDM Vocabulary/ vocabulary mapping
    - Tools for OMOP CDM
    - ETL process
    - Research Experience using OHDSI Network

국제공동연구
제약사 용역 연구 사례

국외 의약품 모니터링 적용 사례

- 올메사르탄과 장질환 (프랑스)

	Crude rate ratio	95% CI	p Value
Overall population			
Olmesartan	2.34	(1.64 to 3.32)	<0.0001
Other ARBs	0.77	(0.57 to 1.04)	0.09
Treatment duration <1 year			
Olmesartan	0.71	(0.36 to 1.39)	0.32
Other ARBs	0.57	(0.37 to 0.86)	0.007
Treatment duration 1–2 years			
Olmesartan	3.44	(1.73 to 6.82)	0.0004
Other ARBs	1.02	(0.55 to 1.89)	0.95
Treatment duration >2 years			
Olmesartan	10.09	(4.80 to 21.20)	<0.0001
Other ARBs	1.66	(0.80 to 3.48)	0.18

올메사르탄과 장질환의 위험성 발표
(프랑스 보험공단팀, 5천1백만명 (전인구 78%)의 보험청구자료 분석)

올메사르탄의 급여 중단 발표

올메사르탄 사례에 대한 국내 반응

올메사르탄의 급여 제한

건약, '올메살탄 치명적 부작용 확실 즉각 조치' 촉구

대응제약 '가격 낮아 문제 없다' 대응 비난, 처방·급여제한 권고

2016-04-19 19:18:40 박현봉 기자 프린트 메일 twitter facebook

건강사회를 위한 약사회가 올메살탄제제가 프랑스에서 부작용 우려로 급여가 중단됐다며 이에 대한 정부의 즉각 조치를 촉구하고 나섰다.

건약은 지난 3일 프랑스 보건당국(ANSM, 이하 ANSM)은 올메살탄 함유 제제의 급여 중단을 발표했다며 심혈관 질환이나 사망률을 감소시키는 효과가 미흡하고 중증 장질환에 따른 상당한 체중감소, 급성신부전을 동반한 만성중증설사, 소화계 합병증 발현 위험성이 있다는 것이 근거라고 밝혔다.

또 이미 2013년 미국 식품의약국에서도 심각한 장질환 부작용 관련 안전성 서한을 배포하는 등 올메살탄의 효과와 안전성은 끊임없는 논란의 중심에 있어왔다고 지적했다.

건약은 "올메텍을 국내에서 판매하고 있는 대웅제약은 보도를 통해 프랑스에서 급여 상환이 중단된 이유가 높은 가격 때문이라며 심지어 국내 약가가 저렴해 아무 조치가 필요 없다고 주장하고 있다"고 밝혔다.

또 "국내 환자들은 효과도 적고 치명적인 부작용을 가진 약을 싸다는 이유로 계속 복용해야 한다는 것인가"라고 반문하며 "대웅제약은 더 이상 국민과 환자를 기만해서는 안 된다"고 비난했다.

부작용 우려로 프랑스의 급여 중단 및 타 약제로 대체 가능

VS

올메사르탄의 급여 유지

고혈압학회 '올메사르탄' 공식 입장

"이 약과 중증 장질환의 연관성 불명확"

16.04.20 06:11 | 최종 업데이트 16.04.20 06:20

대한고혈압학회가 올메사르탄의 부작용 논란과 관련, 올메사르탄에 의한 셀리악병(celiac disease)은 우리나라에서는 실체조차 명확하지 않은 질환이며, 올메사르탄에 대한 장의 반응은 인종적 차이가 있을 것이라는 공식입장을 내놨다.

대한고혈압학회는 최근 이 같은 내용의 '올메사탄 프랑스 이슈에 관한 답변서'를 식약처에 제출했다.

이 답변서는 최근 프랑스 보건당국이 올메사르탄을 의약품 명단에서 삭제(보험급여 중단)한 후 이 약 사용의 부작용 우려가 높아지자 국내 전문가들이 의견을 취합한 것이다.

VS

인종간 유전적 차이 (HLA DQ2/DQ8)
→ 국내에선 부작용 드물 것이라는 의견

시범분석 4 : 이슈 약물의 부작용 사례 분석

올메사르탄의 장질환 위험도 분석

시범 분석 디자인

- 비교대상: 올메사르탄 사용 코호트 vs. ACE 억제제 사용 코호트
- 목표 : 약물 사용 중 장질환 진단 발생
- 교란변수 보정: 연령/ 성별 매치
- 분석자료: 보험공단 100만명 코호트자료

한국인에서는 장병증 발생위험도 증가하지 않음

분석 결과

- 분석 소요 시간 : 8분

장질환	Matched patients (n)	연당 발생율(/1000)	Rate ratio (95% CI)
Olmesartan	20,395	0.22	0.99 (0.24-4.05)
ACEi	20,395	0.26	1.00

참고 자료 (프랑스 보험 자료 분석, Basson et al., 2015)

Table 3 Crude and adjusted rate ratios of hospitalisation with a discharge diagnosis of intestinal malabsorption over time (ref: ACEI)

	Crude rate ratio	95% CI	p Value	Adjusted rate ratio	95% CI	p Value
Overall population						
Olmesartan	2.34	(1.64 to 3.32)	<0.0001	2.49	(1.73 to 3.57)	<0.0001

Comparison of combination treatment in hypertension

Seng Chan You[1,*], Sungjae Jung[1,*], Sungha Park[2], Rae Woong Park[1,3]

[1]Department of Biomedical Informatics, Ajou University School of Medicine, Suwon, Korea

[2]Division of Cardiology, Yonsei University College of Medicine, Seoul, Korea

[3]Department of Biomedical Sciences, Ajou University Graduate School of Medicine, Suwon, Korea

Objective: The goal of this protocols is conducting comparative effectiveness research to establish evidences for optimal anti-hypertensive combination strategies among patients without cardiovascular outcome from various databases across world.

Rationale: High blood pressure is the leading global burden of death and disability. Extensive evidences support the beneficial effects in tight control of blood pressure. Since monotherapy is often insufficient or slow to reach blood pressure target quickly, combination therapy is recommended as the first-line treatment for selected patients with hypertension by the recent guideline to reduce cardiovascular risk. Retrospective observational studies and meta-analysis have suggested that initial combination hypertensive treatment confers decreased risk for cardiovascular events than monotherapy. Only a few randomized clinical trials, however, have directly compared the effects of different regimens of combination. In addition to limited number of evidences from head-to-head comparison, baseline high risk for cardiovascular outcome and previous history of anti-hypertensive medication of participants also make the findings from RCTs difficult to apply to clinical practice. To the best of our knowledge, real-world comparative effectiveness research comparing the various regimens of combination treatment in patients with essential hypertension has not been conducted until now.

Project Lead(s): Seng Chan You, MD, Ajou University, Korea Sungjae Jung, BE, Ajou University, Korea Sungha Park, MD, Yonsei university College of Medicine, Korea Rae Woong Park, MD, PhD, Ajou University, Korea

Coordinating Institution(s): Ajou University, Korea

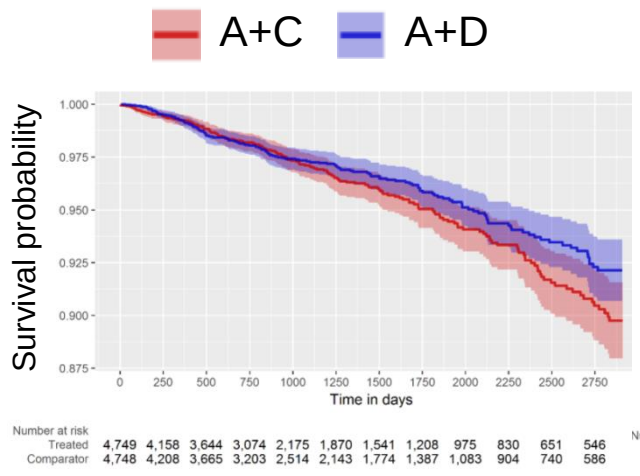
Additional Participants:

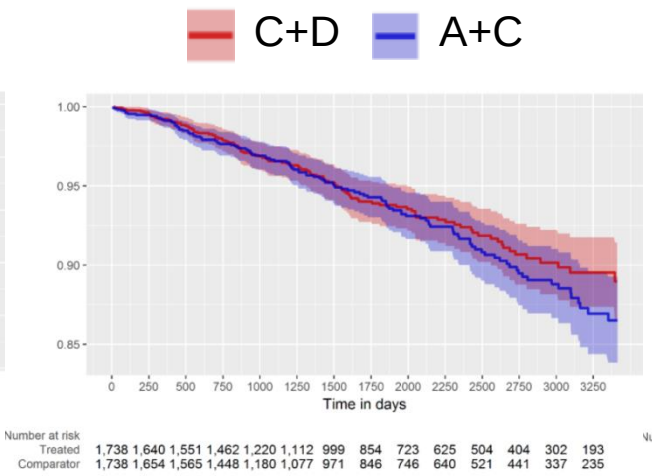
Full Protocol: Word doc for the protocol

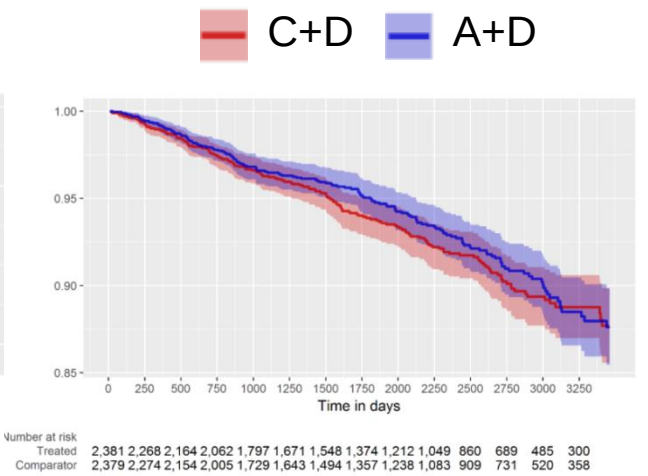
Comparison of combination treatment in hypertension

- Head-to-head comparison of the mortality risk of **combination anti-hypertensive regimens** among patients without high risk for cardiovascular event
  - ACEi/ARB (A)
  - Calcium channel blocker (C)
  - Thiazide diuretics (D)
  - AC vs AD
  - AC vs CD
  - AD vs CD
- Data: Korea National Health Insurance sample cohort database (n = 1 M, 2002-2013)
- N=14,098, follow-up duration: 5.31 ± 3.12 yrs
- Primary Outcome: All-cause mortality

Result: Primary endpoint (All-cause mortality)







P = 0.465

P = 0.465

P = 0.478

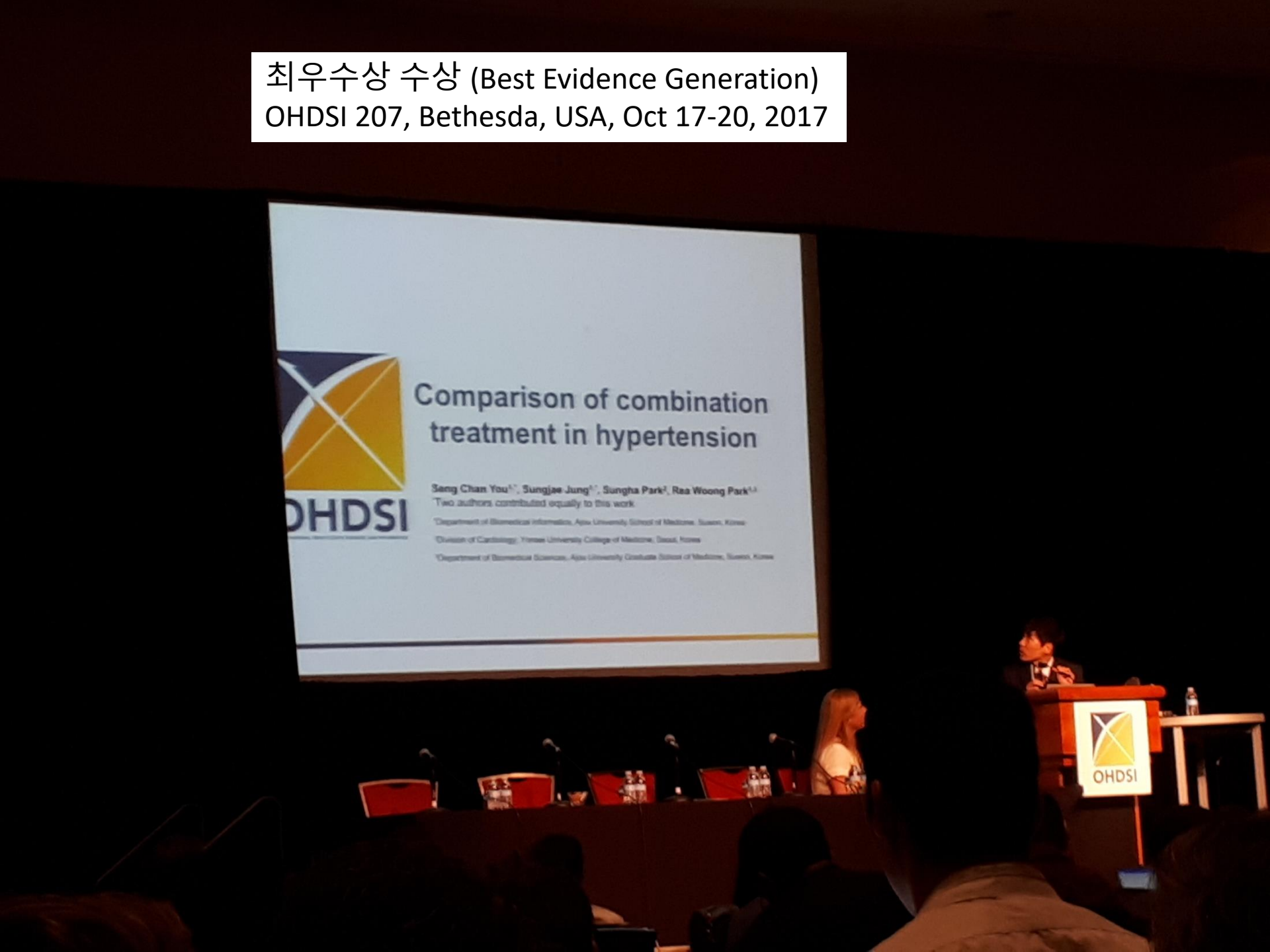
Active drug group	Comparator group	# of active group after matching	# of comparator group after matching	HR	95% CI	P value
A+C	A+D	4751	4751	1.11	0.84-1.49	0.465
C+D	A+C	1739	1739	1.03	0.71-1.33	0.465
C+D	A+D	2382	2382	1.09	0.85-1.41	0.478

There is **no difference in mortality between dual combination** of anti-hypertensive medication

Conclusion

- There is **no differences in reduction of mortality between anti-hypertensive dual-combination regimens** in a population without previous cardiovascular outcomes
- There is no difference in reduction of stroke, myocardial infarction, heart failure, or cardiovascular death among dual-combination regimens
- We’re recruiting international data partners who will run our analytic code on their DB and share the results

최우수상 수상 (Best Evidence Generation)
OHDSI 207, Bethesda, USA, Oct 17-20, 2017



Hi Chan:

You did a great job presenting at the OHDSI Symposium.

I just got internal OOO permission to participate in your study, so we are set to go.

……

I suspect we should have sufficient information in a few different US databases (Truven CCAE, Truven MDCR, Optum SES), in the IMS Germany and JMDC databases.

We could consider applying for ISAC approval to use CPRD for UK EHR.

……

Greetings and congrats on your award.

I'd like to join. I'm at the Univ of OOO. We have not completed our medication mappings to OMOP- and obviously this will need to be done. Do you have an expected date that the data pull?

……

I'm also with the OOO Medical Centers, and I'll solicit their involvement too.

……

Learning Effective Clinical Treatment Pathways for Type-2 Diabetes

Rohit Vashisht, PhD[1]; Kenneth Jung, PhD[1]; Alejandro Schuler, MS[1]; Juan M Banda, PhD[1]; Rae Woong Park, MD, PhD[2,3]; Sanghyung Jin, MS[2]; Li Li, MS, MD[4]; Joel T. Dudley, PhD[4]; Kipp Johnson, MD, PhD[4]; Mark Shervey PhD[4]; Hua Xu PhD[5]; Yonghui Wu PhD[6]; George Hripcsak, MD, MS[7]; Peng Jin, MS[7]; Mui Van Zandt BS[8]; Anthony Reckard BS[8]; Christian Reich, MD[8]; James Weaver MPH, MS[9,10]; Patrick Ryan PhD[10,11] and Nigam H. Shah MBBS, PhD[1]*

1. Center for Biomedical Informatics Research, Stanford University School of Medicine, Stanford, California, USA. 2. Department of Biomedical Informatics, Ajou University School of Medicine, Suwon, Gyeonggi-do, Republic of Korea. 3. Department of Biomedical Sciences, Ajou University Graduate School of Medicine, Suwon, Gyeonggi-do, Republic of Korea. 4. The Institute of Next Generation of Healthcare, Icahn School of Medicine at Mount Sinai, New York, USA. 5. School of Biomedical Informatics, The University of Texas Health Science Center at Houston, Texas, USA. 6. Deaprtment of Health Outcome and Policy, College of Medicine, University of Florida, Gainesville FL, USA 7. Department of Biomedical Informatics, Columbia University, New York, USA. 8. QuintilesIMS. 9. Observational Health Data Sciences and Informatics (OHDSI), New York, NY, USA. 10. Janssen Research and Development, Raritan, New Jersey, USA. 11. Department of Biomedical Informatics, Columbia University, New York, USA

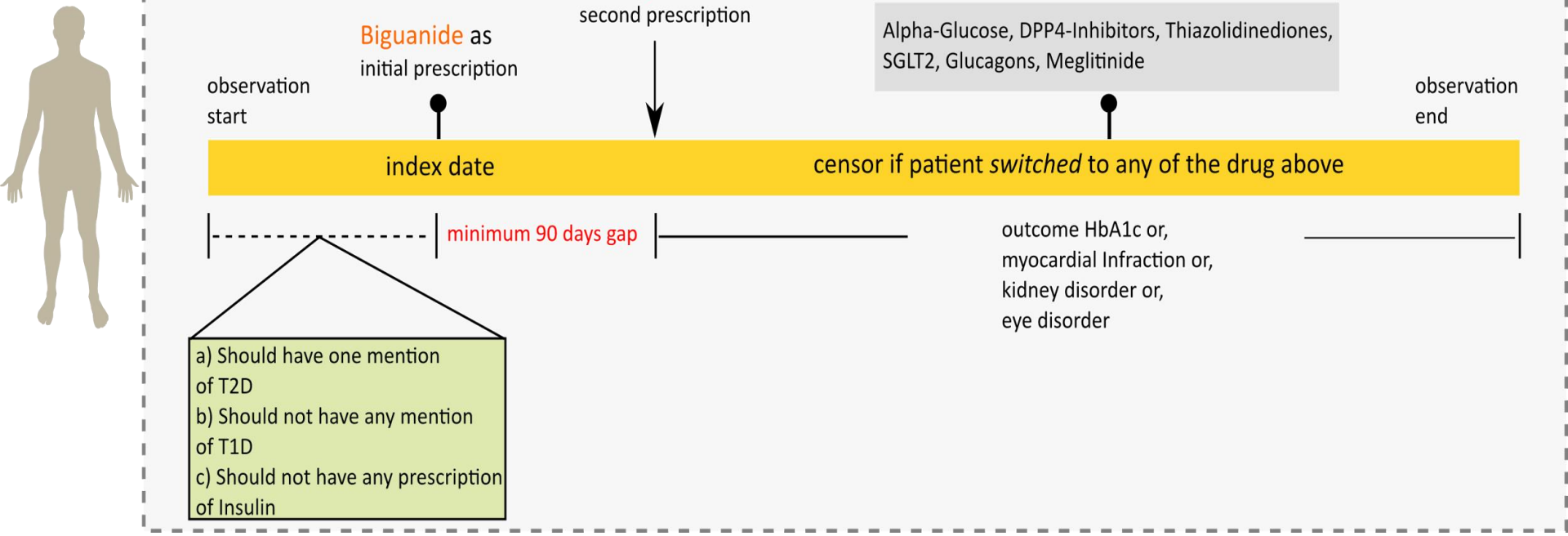
The slides provided by Nigam Shah, *Center for Biomedical Informatics Research, Stanford University School of Medicine*

- **Objectives:** To identify which drug class among sulfonylureas, DPP4 inhibitors, and TZD(thiazolidinediones), is most effective at reducing HbA1c for T2D patients who were uncontrolled with biguanides alone.

- **Design:** Retrospective propensity-matched new-user cohort study across seven sites.

Study design

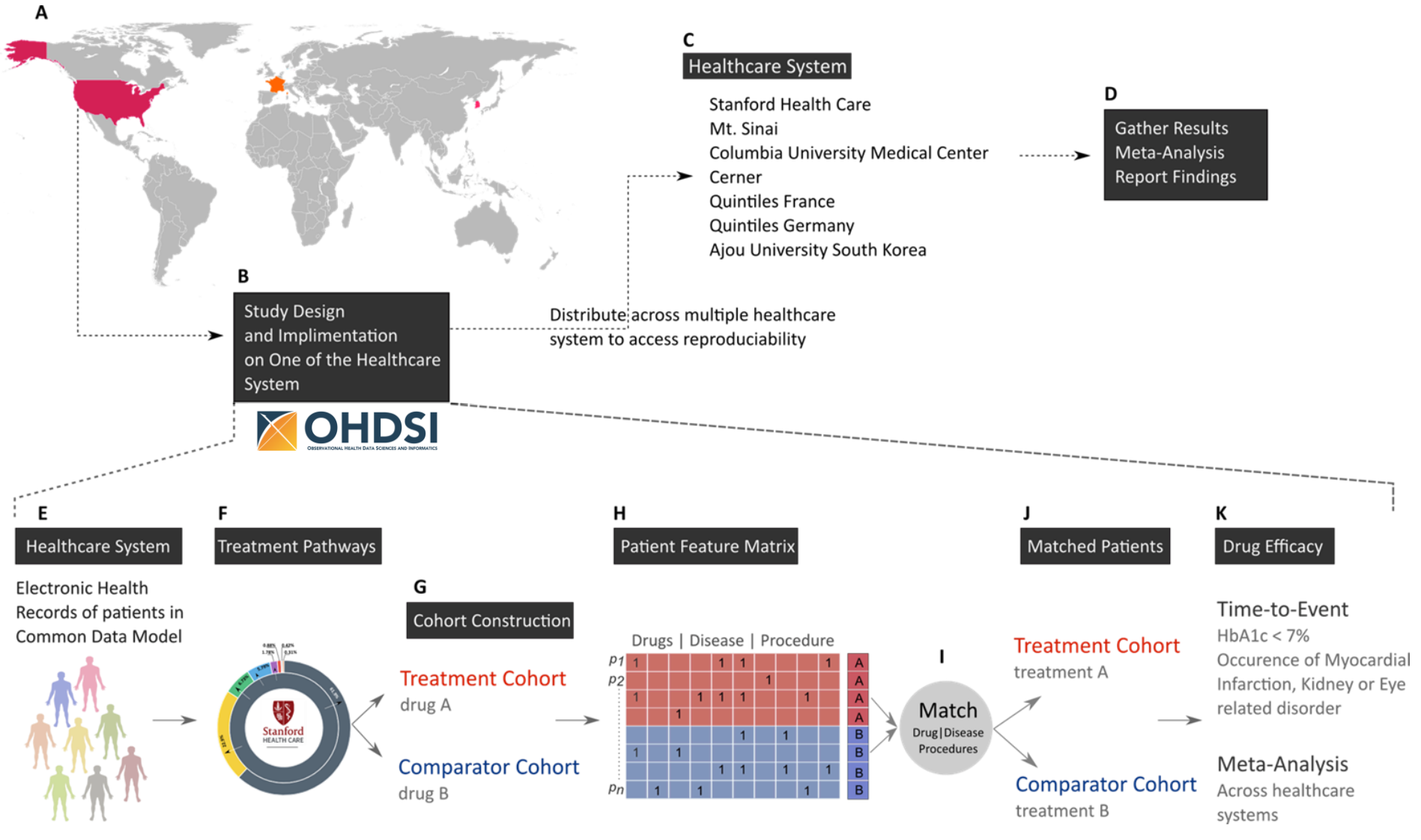
Cohort Construction based on a Single Patients Medical Record



Data Sources

Data Source (Site)	Patients	Female	Male	Time Start	Time End	Total Time
Clinical Data Warehouse (Stanford)	2,307,445	54.38%	45.45%	2007	2017	10 Years
Clinical Data Warehouse (Mt Sinai)	1,941,454	56.14%	43.79%	1979	2014	35 Years
Clinical Data Warehouse (Columbia University Medical Center)	5,405,830	55.96%	43.76%	1985	2016	31 Years
Cerner Health Facts (UT School of Biomedical Informatics)	49,826,219	54.59%	45.41%	1999	2014	15 Years
Medical Claims, Germany (QuintilesIMS)	32,145,904	56.77%	43.19%	1992	2016	25 Years
Medical Claims, France (QuintilesIMS)	9,949,909	52.33%	47.10%	1997	2016	19 Years
AUSOM (Ajou University School of Medicine)	2,275,118	48.00%	52.00%	1994	2015	21 Years
Total Patients	103,851,879					

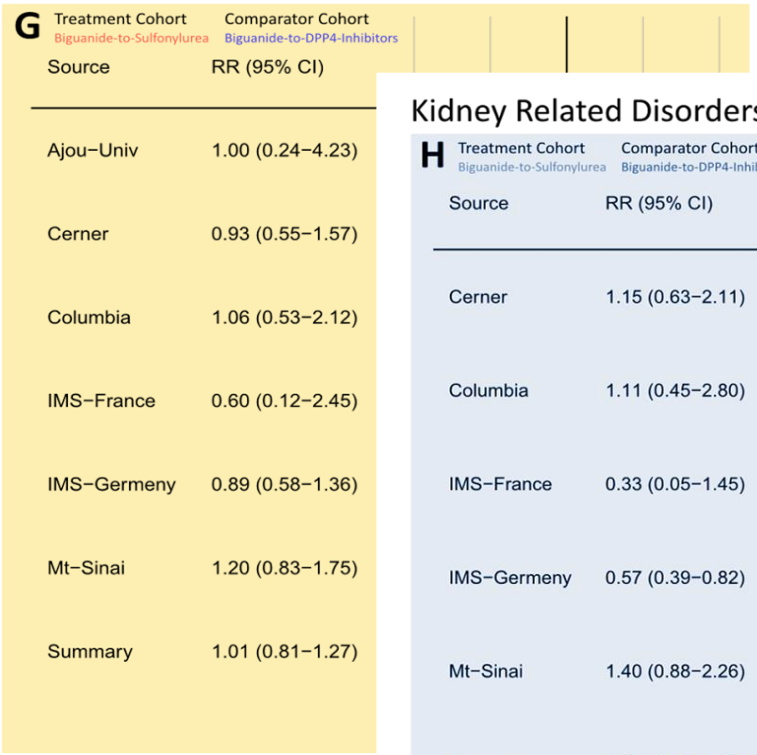
Learning Effective Treatment Pathways from Observational Data: *Analysis of over 103 million patients in 4 Countries*



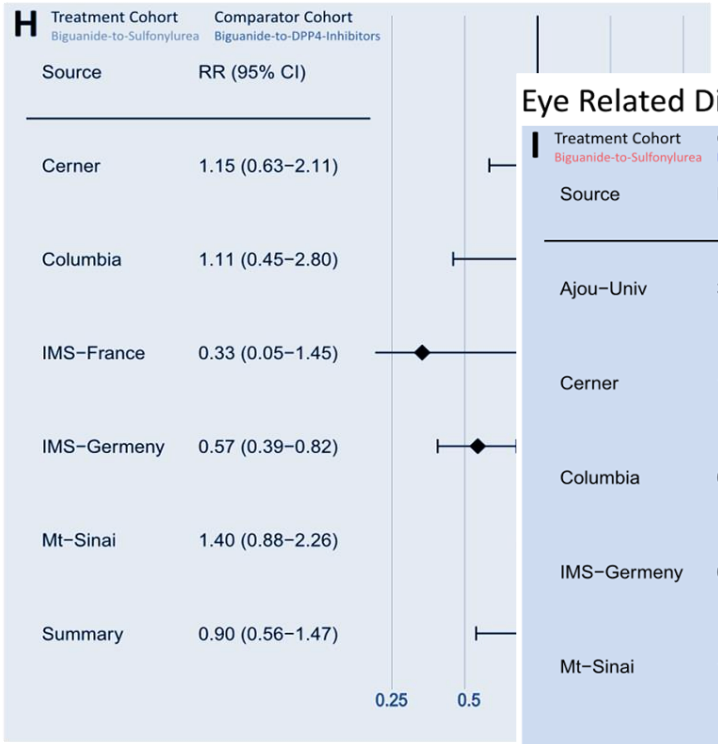
Replication at Other Sites & Meta-Analysis

Reduction in HbA1c <= 7%

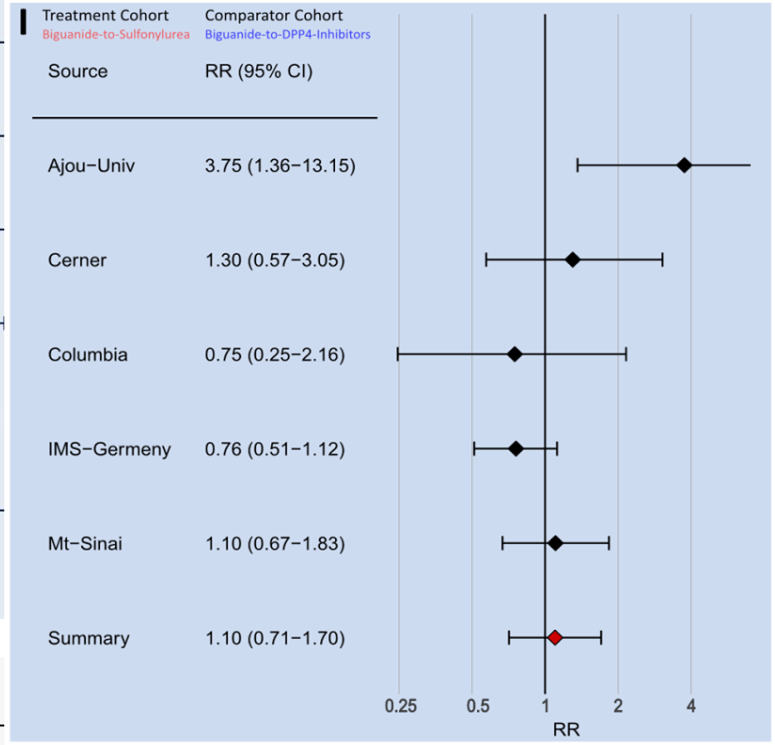
Myocardial Infarction

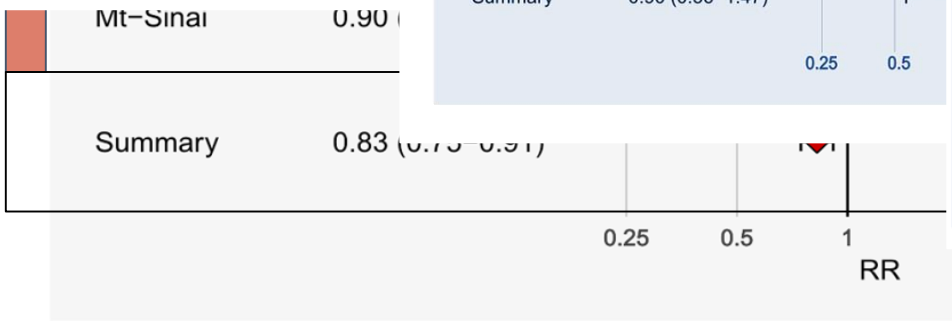


Kidney Related Disorders



Eye Related Disorders





Conclusion

- DPP4-Inhibitors appear to be effective in reducing HbA1c of T2D patients, compared to SU or TZD.
- No difference in preventing events related to myocardial infarction, kidney- and eye-related disorders between DPP4, SU and TZD.
- OHDSI platform enables us to perform large-scale observational studies and assess their reproducibility.
- If you have your data in OHDSI format then we invite you to participate in this study.

CDM for genetics (G-CDM)

Dimensional expansion of data in OMOP-CDM

Seng Chan You,
Seojeong Shin

Sequencing table (1)

No	Column Name	Data Type	Table$Column
1	**sequencing_id**	VARCHAR	<Primary Key> A unique identifier for each sequencing.
2	**person_id**	INT	<Foreign Key> A foreign key identifier to the Person for whom the Sequencing information is recorded.
3	**specimen_collecting_date**	DATE	The date the specimen was obtained from the Person.
4	**specimen_id**		<Foreign Key> A foreign key identifier to the Specimen for which the Sequencing information is recorded.
5	**procedure_id**	INT	<Foreign Key> A foreign key identifier to the Procedure for which the Sequencing information is recorded.
6	**note_id**	INT	<Foreign Key> A foreign key identifier to the Note for which the Sequencing information is recorded.
7	**device**	INT	Sequencer machine information (Illumina Hiseq 2500, Thermo Fisher Ion Torrent, Illumina MiSeq etc.)
8	**library_preparation**	INT	Information about the preparation method for sequencing library (ex: SureSelectXT)
9	**target_capture**	INT	Information about the capture method of Exam and Targeted region (Amplicon, probe capture etc.)
10	**read_type**	INT	Information about the method of reading sequence (Single-end, Paired-end etc.)
11	**read_length**	VARCHAR	Information about the length of Read (101 bp, 35-250 bp etc.)

Sequencing table (2) continued

No	Column Name	Data Type	Table$Column
12	**alignment_tools**	INT	Information about the name of Alignment tool and it's version (ex: BWA-MEM 0.7.12)
13	**variant_calling_tools**	INT	Information about the name of Variant calling tool and it's version (ex: GATK 3.5, SAMTools 1.3.1)
14	**annotation_tools**	VARCHAR	Information about the tool used to Annotation (ANNOVAR, SnpEff 4.3, Ensembl v74 etc.)
15	**annotation_databases**	VARCHAR	Information about the Database used to Annotation (GnomeAD, ClinVar etc.)
16	**chromosome_coordinate**	INT	System for numbering the chromosomes (0-based, 0-based half open, or 1-based coordinated system etc.)
17	**type_of_sample**	VARCHAR	Express the type of specimen by Standard Preanalytical Code (SPREC) V2.0
18	**source_class**	VARCHAR	Express genetic source of patient's specimen by 7 categories; 1) germline, 2) somatic, 3) prenatal/fetal, 4) likely germline, 5) likely somatic, 6) likely prenatal/fetal, 7) unknown genomic origin)
19	**tumor_purity**	INT	Purity of Tumor tissue (%)
20	**reference_genome**	VARCHAR	Information about the Reference genome used to sequencing analysis
21	**pathologic_diagnosis**	VARCHAR	Interpretation and standard suggestion related to the pathogenicity of sequence variant; Pathogenic / Likely_pathogenic / Unknown_significance / Likely_benign / Benign
22	**staging_T**	VARCHAR	Information of Tumor stage T
23	**staging_N**	VARCHAR	Information of Tumor stage N
24	**staging_M**	VARCHAR	Information of Tumor stage M
25	**stage_reference**	VARCHAR	Information of Tumor stage standardization

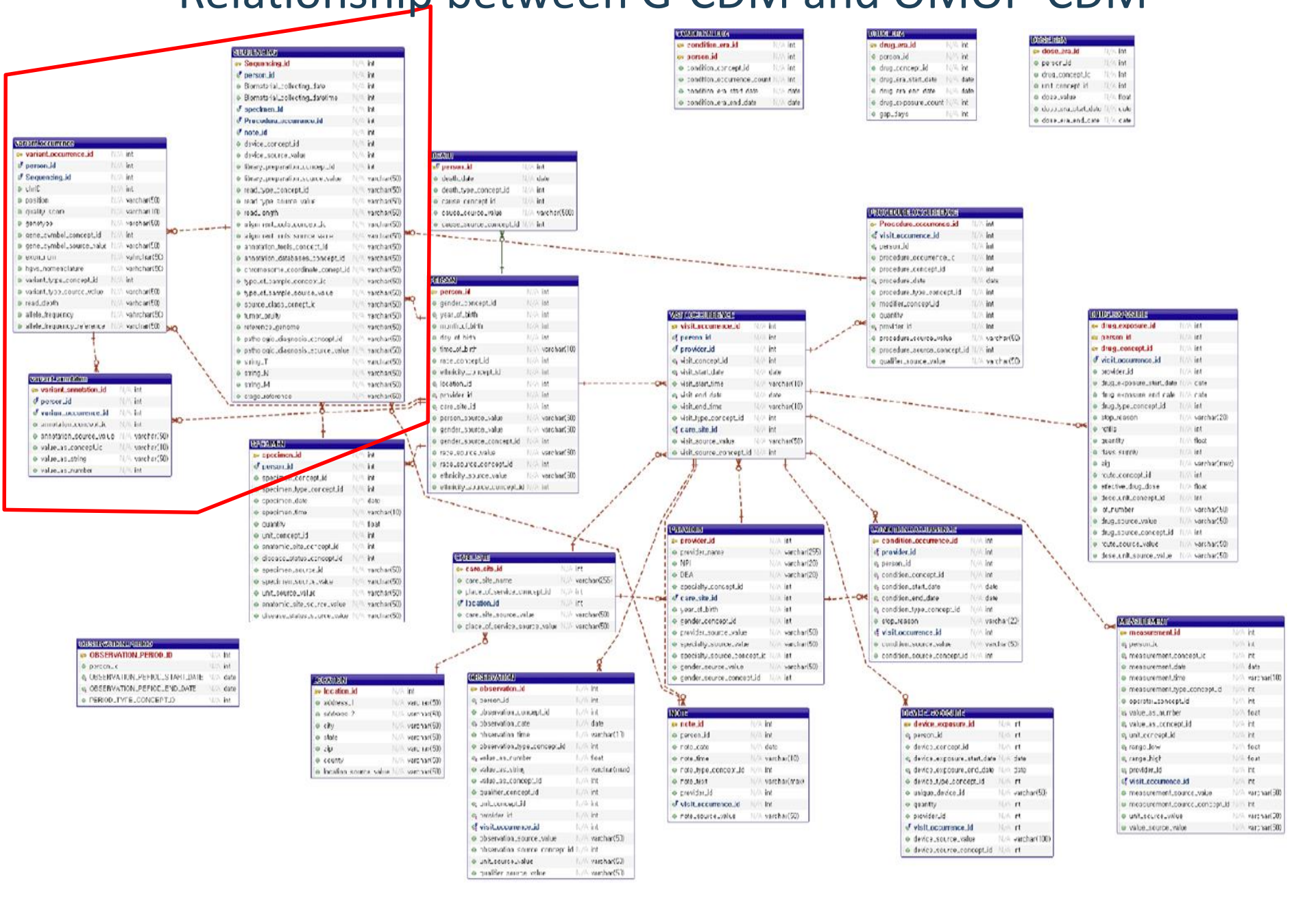
Variant_occurrence table

No.	Column Name	Data Type	Description
1	**variant_occurrence_id**	INT	<Primary Key> A unique identifier for each Variant
2	**person_id**	INT	<Foreign Key> A foreign key identifier to the Person for whom the Sequencing information is recorded.
3	**sequencing_id**	VARCHAR	<Foreign Key> A foreign key identifier to the Sequencing for which the Variant_occurrence information is recorded.
4	**chrID**	VARCHAR	Chromosome number where each variant located. (1~22, X etc.)
5	**position**	INT	Base location number where each variant occurred.
6	**quality_score**	INT	Quality score for each variant calling
7	**genotype**	VARCHAR	The State of Allele pair where each single gene. (Heterozygous or Homozygous)
8	**gene_symbol**	VARCHAR	The name of Genes containing genetic variant.
9	**exon_number**	VARCHAR	Exom_number related to the variant
10	**hgvs_nomenclature**	VARCHAR	Nomenclature about the sequence variant on DNA level.
11	**hgvs_p**	VARCHAR	Nomenclature about the sequence variant on Protein level.
12	**variant_type**	VARCHAR	Variant effect related to protein function (Substitution, Deletion, Duplication, Insertion, Inversion, Conversion etc.)
13	**read_depth**	INT	Average count of nucleotide involved in assembly. (ex: 100x)
14	**allele_frequency**	FLOAT	GNOMAD; Alternative Allele Frequency at each gene location.

Variant_annotation table

No.	Column Name	Data Type	Description
1	**variant_annotation_id**	INT	<Primary Key> A unique identifier for each Variant_annotation.
2	**sequencing_id**	VARCHAR	<Foreign Key> A foreign key identifier to the Sequencing for which t he Variant annotation information is recorded.
3	**variant_occurrence_id**	INT	<Foreign Key> A foreign key identifier to the Variant occurrence for which the Variant annotation information is recorded.
4	**annotation_source_value**	VARCHAR	Annotation data recording categories by data type of list.
5	**value_as_string**	VARCHAR	Annotation values by data type of string.
6	**value_as_number**	FLOAT	Annotation values by data type of numeric.

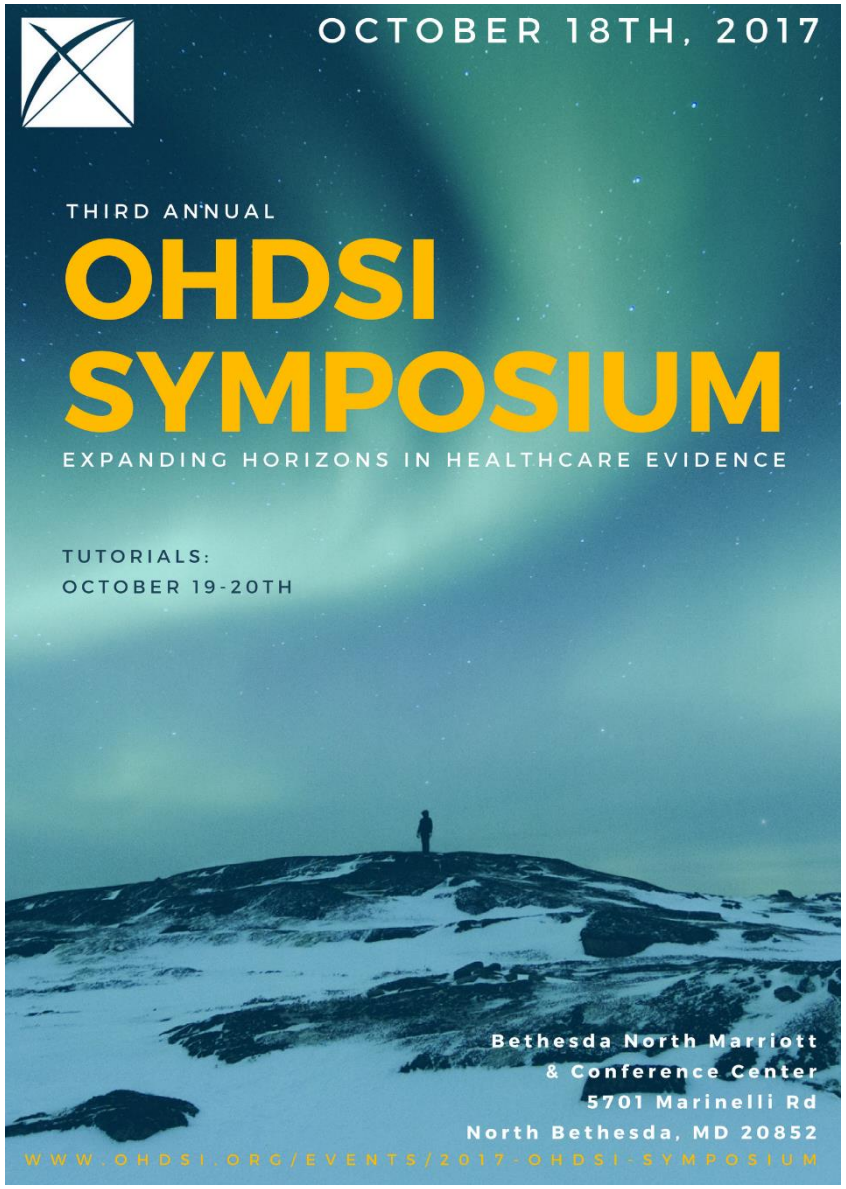
Relationship between G-CDM and OMOP-CDM



Data count from pilot conversion

No	Table_name	row_count
1	person	24
2	visit_occurrence	1307
3	measurement	9738
4	drug_exposure	7768
5	procedure_occurrence	10542
6	condition_occurrence	1310
7	death	0
8	sequencing	24
9	variant_annotation	88596
10	variant_occurrence	2461
11	care_site	8
12	location	451
13	provider	21993
14	Drug_era	1414
15	Dose_era	938
16	Condition_era	369

OMOP – CDM 해외동향



2017 OHDSI Symposium

Posted on October 18, 2017 by Maura Beaton

Date/Time
Date(s) - 10/18/2017 - 10/20/2017
8:00 am - 6:00 pm

Location
Bethesda North Marriott

Categories No Categories

437 participants
from 14 countries
48 from FDA

First Annual

EUROPEAN OHDSI SYMPOSIUM

March 23th 2018

Tutorials March 24th

Bridging Europe

Erasmus MC Rotterdam The Netherlands

Photography: Tom Roeleveld

China, OHDSI


2017中美临床医疗大数据研讨会
暨OHDSI中国工作组年会
2017 China-US healthcare big data forum / OHDSI China Annual Workshop
2017年8月21日 HangZhou, China
主办单位：浙江大学生物医学工程与仪器科学学院
观察性健康医疗数据科学与信息学（OHDSI）中国工作组
电子病历与智能专家系统教育部工程研究中心
OHDSI China
会议地点：浙江省杭州市浙大路38号浙江大学玉泉校区周亦卿大楼1楼报告厅
致谢：本次大会得到腾讯医疗，神州数码医疗科技股份有限公司的大力支持，特此感谢！
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Thank you

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