

コンセプトの海の泳ぎ方

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OHDSI Japan イブニングカンファレンス 2025/10

自己紹介

- 井上 真吾 / Shingo Inoue
- 株式会社Yuimedi 取締役 CTO
 - ex- CureApp
- CS - コンピューターサイエンス
 - JavaScript、データ処理、最近はLLMを用いたシステム開発など
- OMOPについて医療情報の**技術者として**学んでいる
 - 医学分野は素人です



COI: 株式会社Yuimediの役員

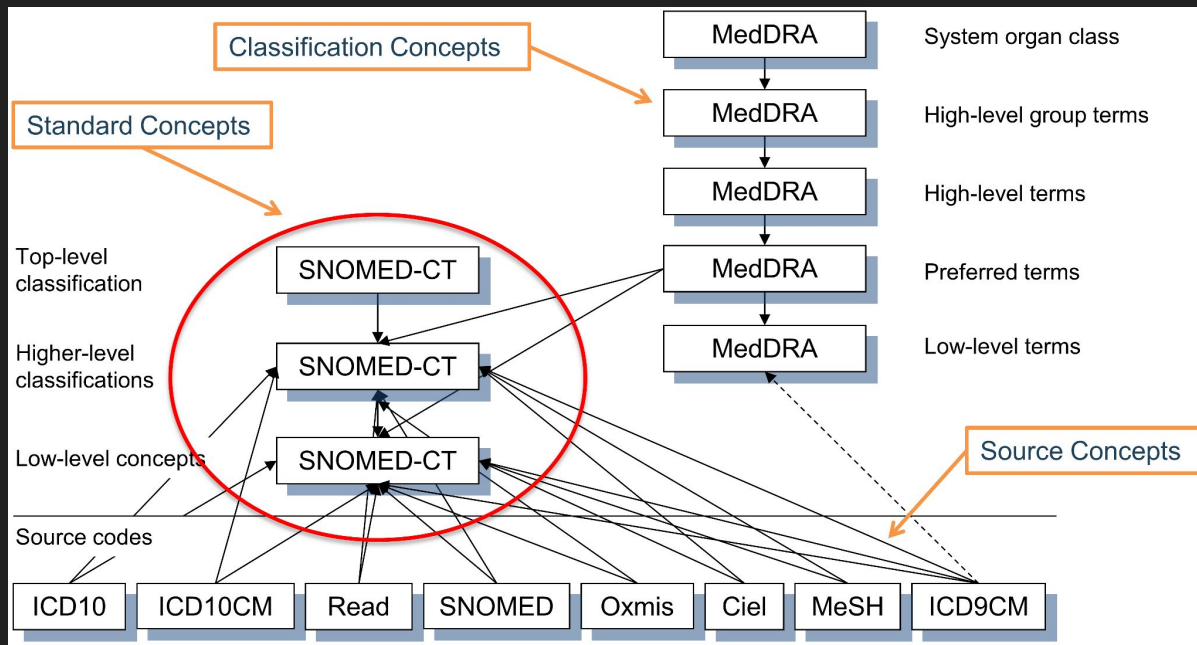
ただし今日はYuimediの話ではなくOMOPそのものの話がメインです

“コンセプト”の解像度を上げる

よく挙げられる画像 →

OMOPにおいて、

- コンセプトとは
- コンセプトにはどのような関連性が定義されているか
- それは具体的にどういうデータによって実現されているか



CONCEPT とは？

5.2 コンセプト

OMOP CDMの臨床イベントはすべてコンセプトとして表現されます。これらはデータレコードの基本的な構成要素であり、ほとんどのテーブルは、いくつかの例外を除いて完全に正規化されています。コンセプトはCONCEPTテーブルに格納されます（図 5.2 を参照）。

CONCEPT_ID	313217
CONCEPT_NAME	Atrial fibrillation
DOMAIN_ID	Condition
VOCABULARY_ID	SNOMED
CONCEPT_CLASS_ID	Clinical Finding
STANDARD_CONCEPT	S
CONCEPT_CODE	49436004
VALID_START_DATE	01-Jan-1970
VALID_END_DATE	31-Dec-2099
INVALID_REASON	

- OMOP独自のID
- 名称(英語)
- OMOP独自の大分類
- コード種別
- コードごとの細分類
- 標準コンセプトか否か
- コード(ex. A00.0)
- 有効期限
- 廃止/削除などのフラグ

図 5.2: OMOP CDMにおける標準化ボキャブラリコンセプトの標準的な表現。提示されている例は心房細動のSNOMEDコードに対するCONCEPTテーブルのレコードです。

コンセプトとは？

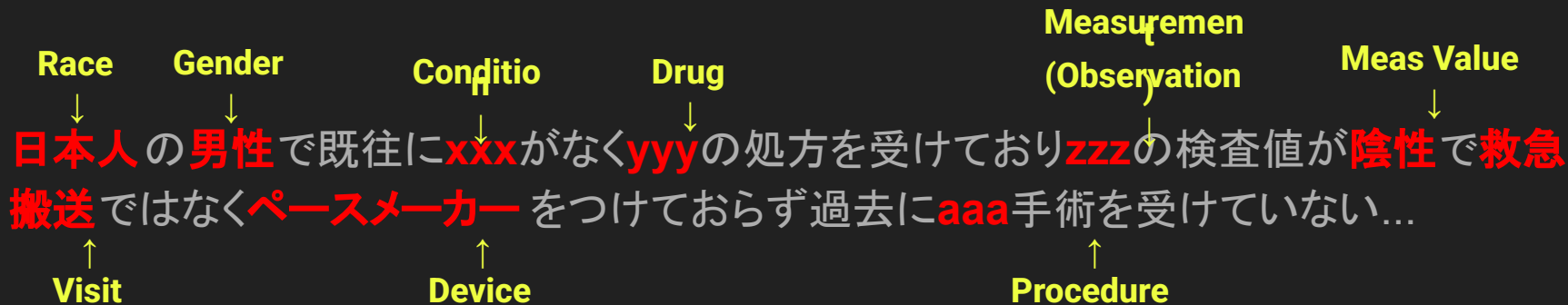
- とは？

- 傷病や医薬品、検体検査など OMOPに格納できるあらゆる臨床的概念を標準化したもの
- 標準/非標準コンセプトに統合することで同じ意味の異なるコード揺れを解消
- ドメインという大分類があり、ドメイン≡原則格納するテーブル /カラムとも言える
 - Genderドメイン → PERSON.gender_concept_id
 - Conditionドメイン → CONDITION_OCCURRENCE.condition_concept_id
 - Unitドメイン → MEASUREMENT.unit_concept_id

- 用途

- コンセプトマッピング: ex. Usagi
- データ品質チェック: ex. Data Quality Dashboard
- OMOPデータの可視化: ex. Achilles, Ares, Atlas (ダッシュボード)
- コホートの定義・絞り込み: ex. AtlasやHADESを用いたRでの分析
 - OMOPにおいては**非数値の検索条件はほぼコンセプト** で表現

非数値の検索条件はほぼコンセプト



CONCEPT系の他のテーブル

- **CONCEPT_ANCESTOR**
 - 親子のみならず祖先 & 子孫の多階層の関係の表現に特化
- **CONCEPT_RELATIONSHIP**
 - とある2コンセプトA, Bにおける汎用的な関連性を表現
- **CONCEPT_SYNONYM**
 - 非英語での名称や略称などの別名を定義。実は日本語データも少量含まれている(後述)
- **DRUG_STRENGTH.csv**
 - 特定の医薬品に含まれる特定成分の量または濃度と関連単位に関する構造化された情報。医薬品の使用状況に関する標準化された分析をサポートするための補足情報
- **RELATIONSHIP.csv**
 - RELATIONSHIPテーブルは、CONCEPT_RELATIONSHIPテーブル内の任意の2つの概念を関連付けるために使用できるあらゆる種類の関係、それぞれの逆関係、およびそれらの階層特性の参照リストを提供します。
 - FACT_RELATIONSHIPテーブルへの入力に使用される臨床ファクト間の関係を表す概念は、CONCEPTテーブルに格納され、関係ドメインに属します。

AtlasのConcept Sets機能は実際何をしているのか？

- AtlasのConcept Setsにある”Descendants (子孫コンセプトを含める)”

The screenshot shows the ATLAS 'New Concept Set' interface. The left sidebar contains navigation links: Home, Data Sources, Search, Concept Sets (active), Cohort Definitions, Characterizations, Cohort Pathways, Incidence Rates, and Profiles. The main area is titled 'New Concept Set' and includes a text input field for the concept set name, a description field, and a table of entries. The table has columns for Concept Id, Concept Code, Concept Name, Domain, Standard Concept Caption, and checkboxes for Exclude, Descendants, and Mapped. The 'Descendants' checkbox is highlighted with a red box.

Concept Id	Concept Code	Concept Name	Domain	Standard Concept Caption	Exclude	Descendants	Mapped
320128	59621000	Essential hypertension	Condition	Standard	☒	☒	☐

- 該当コード: CONCEPT_ANCESTORを使用してSQLで子孫を検索してる

```
1 select c.concept_id
2 from @vocabulary_database_schema.CONCEPT c
3 join @vocabulary_database_schema.CONCEPT_ANCESTOR ca on c.concept_id = ca.descendant_concept_id
4 WHERE c.invalid_reason is null
5 and @conceptIdIn
```

<https://github.com/OHDSI/circe-be/blob/master/src/main/resources/resources/vocabulary/sql/conceptSetDescendants.sql>

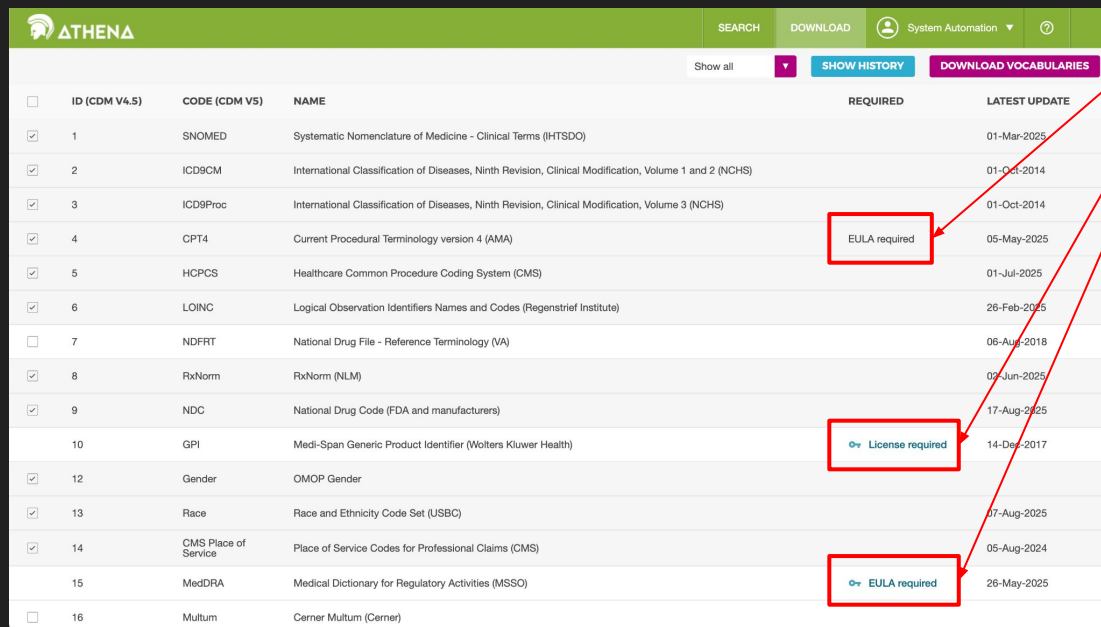
コンセプトの海へ潜っていきます

- 傷病、処方、検査あたりにフォーカスして潜ってみます
 - [第5章 標準化ボキャブラリ | OHDSIの本](#) を読むとより理解が深まります
- SQLというデータ取得言語を記載し図の結果が得られる操作方法を示します
 - 表も併記します。視覚的にも見れます
- Disclaimer
 - ハンズオンではないため step by step とまでは行かず端折る箇所が多々あります
 - SQLは本質的には重要ではないので解説しません
 - SQLのsyntaxはDuckDBという軽量高速なDBを前提に記述しています
 - DuckDBとAthenaからダウンロードした各種 CSVファイルが手元にあれば再現可能です



OHDSI Athenaとは

- OMOPのコンセプトの検索および閲覧、一括ダウンロードツール
- ダウンロードしたいボキャブラリを選択しダウンロード(一部要ライセンス)



	ID (CDM V4.5)	CODE (CDM V5)	NAME	REQUIRED	LATEST UPDATE
☒	1	SNOMED	Systematic Nomenclature of Medicine - Clinical Terms (HTSDO)		01-Mar-2025
☒	2	ICD9CM	International Classification of Diseases, Ninth Revision, Clinical Modification, Volume 1 and 2 (NCHS)		01-Oct-2014
☒	3	ICD9Proc	International Classification of Diseases, Ninth Revision, Clinical Modification, Volume 3 (NCHS)		01-Oct-2014
☒	4	CPT4	Current Procedural Terminology version 4 (AMA)	EULA required	05-May-2025
☒	5	HCPCS	Healthcare Common Procedure Coding System (CMS)		01-Jul-2025
☒	6	LOINC	Logical Observation Identifiers Names and Codes (Regenstrief Institute)		26-Feb-2025
☐	7	NDFRT	National Drug File - Reference Terminology (VA)		06-Aug-2018
☒	8	RxNorm	RxNorm (NLM)	EULA required	03-Jun-2025
☒	9	NDC	National Drug Code (FDA and manufacturers)		17-Aug-2025
	10	GPI	Medi-Span Generic Product Identifier (Wolters Kluwer Health)	License required	14-Dec-2017
☒	12	Gender	OMOP Gender		
☒	13	Race	Race and Ethnicity Code Set (USBC)		07-Aug-2025
☒	14	CMS Place of Service	Place of Service Codes for Professional Claims (CMS)		05-Aug-2024
	15	MedDRA	Medical Dictionary for Regulatory Activities (MSSO)	EULA required	26-May-2025
☐	16	Multum	Cerner Multum (Cerner)		

Athenaからダウンロードしたzipファイルの中身

- CDMのテーブル定義と同名のCSVが9ファイル
 - マスタ: VOCABULARY.csv、DOMAIN.csv、CONCEPT_CLASS.csv、CONCEPT.csv
 - 付加情報: CONCEPT_SYNONYM.csv、DRUG_STRENGTH.csv
 - 関係性: CONCEPT_ANCESTOR.csv、CONCEPT_RELATIONSHIP.csv、RELATIONSHIP.csv
- CPT4専用処理:
 - CPT4を選択してダウンロードするとCPT4のライセンスを持ってる人だけがCPT4を復元できるプログラム群が出現
 - CONCEPT_CPT4.csv、cpt.bat、cpt.sh、cpt4.jar

ボキャブラリに含まれるコンセプト

CONCEPT.csvに含まれるボキャブラリとその出現回数を多い順に表示

RxNorm Extensionが最多。次点でNDC, SNOMED...



```
1 SELECT vocabulary_id, COUNT(*)
2 FROM read_csv('./CONCEPT.csv')
3 GROUP BY vocabulary_id
4 ORDER BY COUNT(*) DESC
```

59 rows returned in 294ms

T	vocabulary_id	123	count	star()
	RxNorm Extension		2171452	
	NDC		1279180	
	SNOMED		1093147	
	SPL		839280	
	RxNorm		313091	
	LOINC		277764	
	OSM		203339	
	ICD10CM		100035	
	ICD9CM		17564	
	ICD10		16638	
	HCPCS		12434	
	ATC		7223	
	Cancer Modifier		6043	
	ICD9Proc		4657	

ドメインに属するコンセプト数の分布

CONCEPT.csvのうち、ドメインとその出現回数を多い順に表示

RxNorm ExtensionによりDrugが圧倒的に多い



```
1 SELECT domain_id, COUNT(*)
2 FROM read_csv('./CONCEPT.csv')
3 GROUP BY domain_id
4 ORDER BY COUNT(*) DESC
```

34 rows returned in 345ms

T domain_id	123 count_star()
Drug	4853487
Observation	380534
Condition	283991
Device	237424
Geography	204037
Measurement	197790
Procedure	101918
Spec Anatomic Site	41474
Meas Value	26520
Metadata	4822
Note	4152
Type Concept	3810
Unit	2490
Specimen	2114

SYNONYMを使って略称からコンセプトを探す

- synonym=別名を使ってコンセプトを探すことも可能
 - Athenaが略称でコンセプトを探せるのはこの定義のおかげ

```
1  SELECT concept.*
2  FROM read_csv('./CONCEPT_SYNONYM.csv') synonym
3  INNER JOIN read_csv('./CONCEPT.csv') concept
4    ON synonym.concept_id = concept.concept_id
5  WHERE synonym.concept_synonym_name ILIKE '%T2DM%'
```

1 row returned in 630ms

123 concept_id	T concept_name	T domain_id	T vocabulary_id	T concept_class_id	T
201826	Type 2 diabetes mellitus	Condition	SNOMED	Disorder	S

蛇足: 日本語SYNONYMは 住所パーツのみ定義

もし傷病/医薬品などの別名を載せられたら
Athenaでの日本語検索が可能に



```
1 SELECT
2     concept.domain_id,
3     synonym.concept_id,
4     synonym.concept_synonym_name
5 FROM read_csv('./CONCEPT_SYNONYM.csv') synonym
6 INNER JOIN read_csv('./CONCEPT.csv') concept
7     ON synonym.concept_id = concept.concept_id
8 INNER JOIN read_csv('./CONCEPT.csv') lang
9     ON synonym.language_concept_id = lang.concept_id
10 WHERE lang.concept_name = 'Japanese language'
```

8,851 rows returned in 694ms

T domain_id	123 concept_id	T concept_synonym_name
Geography	42000423	いすみ市
Geography	42000301	一宮町
Geography	42000918	九十九里町
Geography	42001838	佐倉市
Geography	42002303	八千代市
Geography	42002302	八街市
Geography	42000720	勝浦市
Geography	42002118	匝瑳市
Geography	42001122	南房総市
Geography	42000393	印西市
Geography	42000809	君津市
Geography	42007289	四街道市
Geography	42002131	多古町
Geography	42001653	大多喜町

CONCEPT_RELATIONSHIPの外観

コンセプト1とコンセプト2はどのような関係性なのか
=relationship_id

双方向に関係性が定義(ex. 親→子と子→親)

```
1 SELECT
2   relationship_id,
3   COUNT(*)
4 FROM read_csv('./CONCEPT_RELATIONSHIP.csv')
5 GROUP BY relationship_id
6 ORDER BY COUNT(*) DESC
```

328 rows returned in 1.0s

T relationship_id	123	count_star()
Mapped from		4554506
Maps to		4554506
Marketed form of		2020882
Has marketed form		2020882
RxNorm has dose form		1797987
RxNorm dose form of		1797987
Is a		1719011
Subsumes		1719011
Has brand name		1473555
Brand name of		1473555
Tradename of		1060811
Has tradename		1060811
RxNorm - SPL		764666
SPL - RxNorm		764666

ex. ICD10:I10(本態性高血圧)に紐づいたコンセプト

- CONCEPTとCONCEPT_RELATIONSHIPの結合は海に潜る必須道具
- Is a:40475095
 - 1つ親(I10-I15 高血圧性疾患)
- Maps to: 標準コンセプトへ
 - SNOMEDへのマッピング定義

▶ ▼

memory ▼

```
1 SELECT rel.relationship_id, c2.*
2 FROM read_csv('./CONCEPT.csv') c1
3 INNER JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
4     ON rel.concept_id_1 = c1.concept_id
5 INNER JOIN read_csv('./CONCEPT.csv') c2
6     ON rel.concept_id_2 = c2.concept_id
7 WHERE c1.vocabulary_id = 'ICD10'
8     AND c1.concept_code = 'I10' -- 本態性(原発性<一次性>) 高血圧 (症)
```

2 rows returned in 1.5s

T relationship_id	123	concept_id	T concept_name	T domain_id	T vocabulary_id	T concept_name
Is a		40475095	Hypertensive diseases	Condition	ICD10	ICD10 St
Maps to		320128	Essential hypertension	Condition	SNOMED	Disorder

祖先、子孫の探索

- 直下・直上より多階層の探索はCONCEPT_ANCESTORを用いると楽
 - Atlasの”Descendants”でも実際に使われている(前述)

9 rows returned in 1.8s

T_vocabulary_id	T_concept_code	T_concept_name
SNOMED	44054006	Type 2 diabetes mellitus
SNOMED	73211009	Diabetes mellitus
SNOMED	362969004	Disorder of endocrine system
SNOMED	126877002	Disorder of glucose metabolism
SNOMED	362965005	Disorder of body system
SNOMED	20957000	Disorder of carbohydrate metabolism
SNOMED	75934005	Metabolic disease
SNOMED	64572001	Disease
SNOMED	404684003	Clinical finding

SNOMED:T2DM

の

←祖先と子孫→

15 rows returned in 1.9s

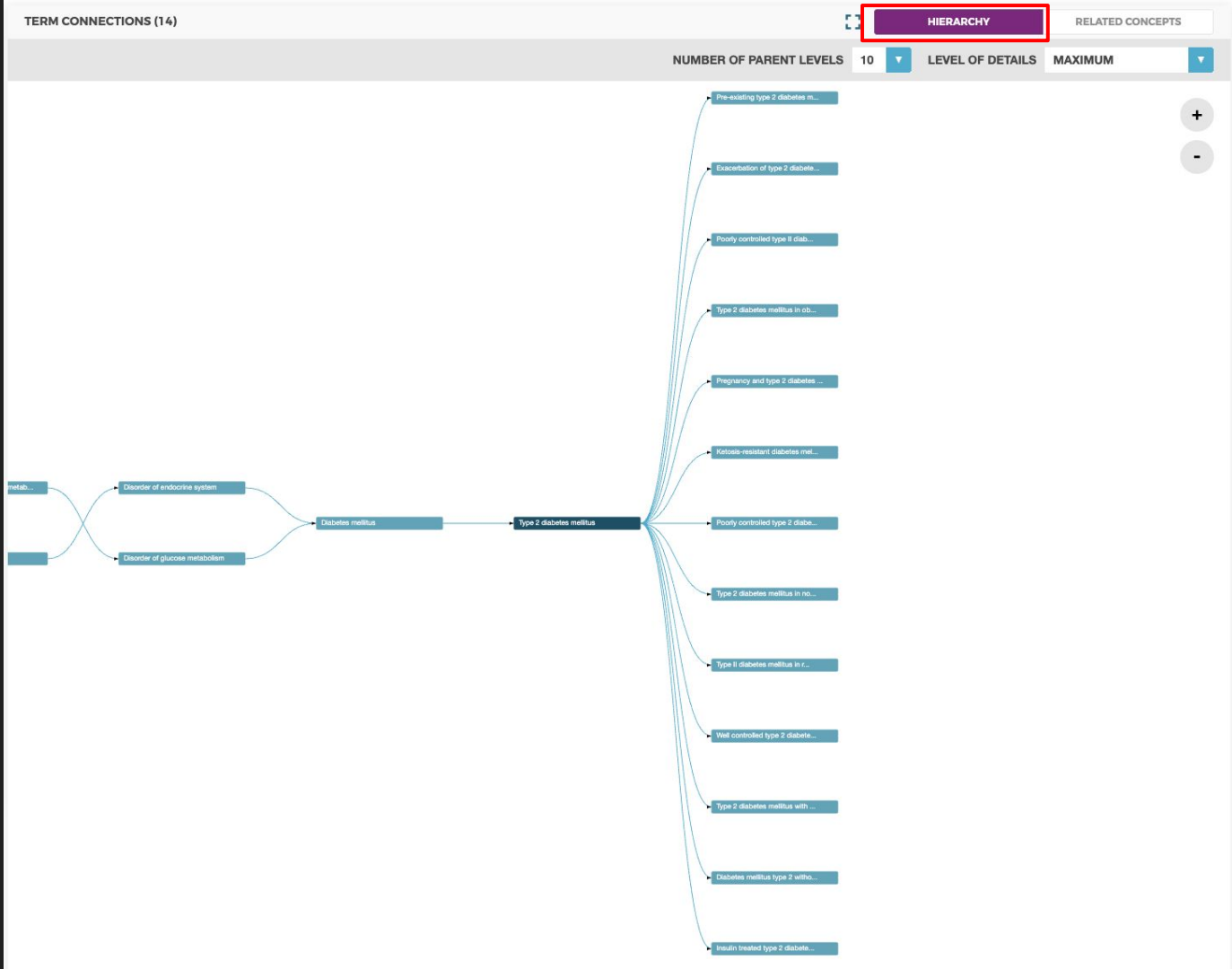
T_vocabulary_id	T_concept_code	T_concept_name
SNOMED	44054006	Type 2 diabetes mellitus
SNOMED	444110003	Well controlled type 2 diabetes mellitus
SNOMED	237599002	Insulin treated type 2 diabetes mellitus
OMOP Extension	OMOP5181808	Exacerbation of type 2 diabetes mellitus
SNOMED	81531005	Type 2 diabetes mellitus in obese
SNOMED	199230006	Pre-existing type 2 diabetes mellitus
SNOMED	190389009	Type 2 diabetes mellitus with ulcer
SNOMED	359642000	Type 2 diabetes mellitus in nonobese
SNOMED	237627000	Pregnancy and type 2 diabetes mellitus
SNOMED	1217044000	Ketosis-resistant diabetes mellitus
SNOMED	1481000119100	Diabetes mellitus type 2 without retinopathy
SNOMED	703138006	Type II diabetes mellitus in remission
SNOMED	164971000119101	Type 2 diabetes mellitus controlled by diet
SNOMED	201000119106	Disorder due to well controlled type 2 diabetes ...

```
1 SELECT c2.vocabulary_id, c2.concept_code, c2.concept_name
2 FROM read_csv('./CONCEPT.csv') c1
3 JOIN read_csv('./CONCEPT_ANCESTOR.csv') ca ON c1.concept_id = ca.descendant_concept_id
4 JOIN read_csv('./CONCEPT.csv') c2 ON ca.ancestor_concept_id = c2.concept_id
5 WHERE c1.concept_code = '44054006' -- Type 2 diabetes mellitus
6 ORDER BY ca.min_levels_of_separation
```

Athenaでも子孫、祖先が見れる

コンセプト詳細画面の
HIERARCHYタブでも
CONCEPT_ANCESTOR
が用いられている

コンセプトマッピングの粒
度を調整したい時に俯瞰
できて便利



標準→非標準

- SNOMED: Type 2 diabetes mellitusに統合される非標準概念の一覧
 - ‘Mapped from’という関係性で辿れる。ICD10やICD10CM、ICD9CM、**SNOMED**などが該当、同一ボキャブラリ内でも標準 / 非標準が分かれる

101 rows returned in 1.8s

T relationship_id	123 concept_id	T concept_name	T domain_id	T vocabulary_id	T concept_class_id	T standard_concept	T concept_code
Mapped from	45571656	Type 2 diabetes mellitus	Condition	ICD10	ICD10 Hierarchy	NULL	E11
Mapped from	45576441	Type 2 diabetes mellitus, with coma	Condition	ICD10	ICD10 code	NULL	E11.0
Mapped from	45542739	Type 2 diabetes mellitus, with ketoacidosis	Condition	ICD10	ICD10 code	NULL	E11.1
Mapped from	45605400	Type 2 diabetes mellitus, with renal complicatio...	Condition	ICD10	ICD10 code	NULL	E11.2
Mapped from	45591028	Type 2 diabetes mellitus, with ophthalmic comp...	Condition	ICD10	ICD10 code	NULL	E11.3
Mapped from	45557114	Type 2 diabetes mellitus, with peripheral circula...	Condition	ICD10	ICD10 code	NULL	E11.5
Mapped from	3522662	Type II diabetes mellitus	Observation	SNOMED	Undefined	NULL	50231000000106
Mapped from	3522803	Type II diabetes mellitus	Observation	SNOMED	Undefined	NULL	78451000000104
Mapped from	4193704	Type 2 diabetes mellitus without complication	Condition	SNOMED	Disorder	NULL	313436004
Mapped from	40386790	Type II diabetes mellitus without complication	Condition	SNOMED	Disorder	NULL	190395005
Mapped from	3522470	Type II diabetes mellitus	Observation	SNOMED	Undefined	NULL	
Mapped from	40482801	Uncontrolled type 2 diabetes mellitus	Condition	SNOMED	Disorder	NULL	
Mapped from	40483315	Brittle type 2 diabetes mellitus	Condition	SNOMED	Disorder	NULL	
Mapped from	37200249	Type 2 diabetes mellitus with proliferative diabe...	Condition	ICD10CM	7-char billing code	NULL	

```
1 SELECT
2   rel.relationship_id,
3   c2.*
4 FROM read_csv('./CONCEPT.csv') c1
5 INNER JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
6   ON rel.concept_id_1 = c1.concept_id
7   AND rel.relationship_id = 'Mapped from'
8 INNER JOIN read_csv('./CONCEPT.csv') c2
9   ON rel.concept_id_2 = c2.concept_id
10 WHERE c1.vocabulary_id = 'SNOMED'
11        AND c1.concept_code = '44054006' -- Type 2 diabetes mellitus
```

非標準→標準

- ICD10:I10(非標準)を標準にマッピングした結果SNOMEDになった
- Maps toを用いることで非標準→標準が可能

T_vocabulary_id	T_concept_code	T_concept_name	T_relationship_id	T_vocabulary_id_1	T_concept_code_1	T_concept_name_1
ICD10	I10	Essential (primary) hypertension	Maps to	SNOMED	59621000	Essential hypertension

```
▶ ▼
1  SELECT
2    c1.vocabulary_id, c1.concept_code, c1.concept_name,
3    rel.relationship_id,
4    c2.vocabulary_id, c2.concept_code, c2.concept_name
5  FROM read_csv('./CONCEPT.csv') c1
6  INNER JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
7    ON rel.concept_id_1 = c1.concept_id
8     AND rel.relationship_id = 'Maps to'
9  INNER JOIN read_csv('./CONCEPT.csv') c2
10   ON rel.concept_id_2 = c2.concept_id
11     AND c2.standard_concept = 'S'
12 WHERE c1.vocabulary_id = 'ICD10'
13        AND c1.concept_code = 'I10' -- 本態性（原発性＜一次性＞）高血圧（症）
```

Athenaの定義だけでどこまでコードマッピングできるか

- 用意されている非標準→標準コンセプトのカバレッジ
- ICD10/ATCレベルの粒度粗め・やや欠損なOMOP変換ならこれくらい

```
1 SELECT
2   COUNT(*) AS all,
3   COUNT(c2.concept_id) AS mapped,
4   COUNT(c2.concept_id) / COUNT(*) AS "mapped_%",
5 FROM read_csv('./CONCEPT.csv') c1
6 LEFT JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
7   ON rel.concept_id_1 = c1.concept_id
8   AND rel.relationship_id = 'Maps to'
9 LEFT JOIN read_csv('./CONCEPT.csv') c2
10  ON rel.concept_id_2 = c2.concept_id
11   AND c2.vocabulary_id = 'SNOMED'
12   AND c2.standard_concept = 'S'
13 WHERE c1.vocabulary_id = 'ICD10'
```

1 row returned in 1.6s

123 all	123 mapped	# mapped_%
19418	18512	0.9533422597589865

```
1 SELECT
2   COUNT(*) AS all,
3   COUNT(c2.concept_id) AS mapped,
4   COUNT(c2.concept_id) / COUNT(*) AS "mapped_%",
5 FROM read_csv('./CONCEPT.csv') c1
6 LEFT JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
7   ON rel.concept_id_1 = c1.concept_id
8   AND rel.relationship_id = 'Maps to'
9 LEFT JOIN read_csv('./CONCEPT.csv') c2
10  ON rel.concept_id_2 = c2.concept_id
11   AND c2.vocabulary_id IN ('RxNorm', 'RxNorm Extension')
12   AND c2.standard_concept = 'S'
13 WHERE c1.vocabulary_id = 'ATC'
```

1 row returned in 1.5s

123 all	123 mapped	# mapped_%
7861	5886	0.7487596997837426

ex. RxNorm:1191(aspirin)に紐づいたコンセプト(一部)

- ‘RxNorm ing of’はこのコンセプト(成分)を元にした医薬品

10 rows returned in 1.5s

T relationship_id	T any_value(c2.vocabulary_id)	T any_value(c2.concept_code)	T any_value(c2.concept_name)	T any_value(c2.concept_class_id)
Has brand name	RxNorm Extension	OMOP5044631	Togal Kopfschm	Brand Name
Has form	RxNorm	314293	acetylsalicylate sodium	Precise Ingredient
Mapped from	SNOMED	322310004	Aspirin + codeine 400mg/8mg dispersible tablet	Pharma/Biol Product
RxNorm - ATC pr lat	ATC	A01AD05	acetylsalicylic acid; local oral	ATC 5th
RxNorm - ATC pr up	ATC	B01AC30	platelet aggregation inhibitors excl. heparin - c...	ATC 5th
RxNorm - ATC sec lat	ATC	C10BX05	rosuvastatin and acetylsalicylic acid; systemic	ATC 5th
RxNorm - ATC sec up	ATC	A03BA04	belladonna total alkaloids; oral	ATC 5th
RxNorm - SNOMED eq	SNOMED	387458008	Aspirin	Substance
RxNorm ing of	RxNorm Extension	OMOP1076760	Aspirin / Calcium Carbonate / magnesium carbo...	Clinical Drug Form
Value mapped from	SNOMED	395102008	H/O: aspirin allergy	Context-dependent

```
1 SELECT rel.relationship_id, any_value(c2.vocabulary_id), any_value(c2.concept_code), any_value(c2.concept_name), any_value(c2.concept_class_id)
2 FROM read_csv('./CONCEPT.csv') c1
3 INNER JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
4   ON rel.concept_id_1 = c1.concept_id
5 INNER JOIN read_csv('./CONCEPT.csv') c2
6   ON rel.concept_id_2 = c2.concept_id
7   AND rel.concept_id_1 != rel.concept_id_2
8 WHERE c1.vocabulary_id = 'RxNorm'
9   AND c1.concept_code = '1191' -- aspirin
10 GROUP BY rel.relationship_id
11 ORDER BY rel.relationship_id
```

ex. バイアスピリン錠100mgの関連コンセプト

- Consists of: 剤形を問わない成分と容量だけ抽出
- RxNorm has dose form: 剤形だけ抽出
- RxNorm is a: RxNorm専用の親子関係

5 rows returned in 1.5s

T relationship_id	concept_id	T concept_name	T domain_id	T vocabulary_id	T concept_class_id	T standard_concept	T concept_code
Consists of	36277089	Aspirin 100 MG [Bayer Aspirin]	Drug	RxNorm Extension	Branded Drug Comp	S	OMOP3127964
Has brand name	19055970	Bayer Aspirin	Drug	RxNorm	Brand Name	NULL	215568
RxNorm has dose form	19082573	Oral Tablet	Drug	RxNorm	Dose Form	NULL	317541
RxNorm is a	40010186	aspirin Oral Tablet [Bayer Aspirin]	Drug	RxNorm	Branded Drug Form	S	368457
Tradename of	1113143	aspirin 100 MG Oral Tablet	Drug	RxNorm	Clinical Drug	S	246461

▶ ▼

```
1 SELECT rel.relationship_id, c2.|
2 FROM read_csv('./CONCEPT.csv') c1
3 INNER JOIN read_csv('./CONCEPT_RELATIONSHIP.csv') rel
4     ON rel.concept_id_1 = c1.concept_id
5 INNER JOIN read_csv('./CONCEPT.csv') c2
6     ON rel.concept_id_2 = c2.concept_id
7     AND rel.concept_id_1 != rel.concept_id_2
8 WHERE c1.vocabulary_id = 'RxNorm Extension'
9     AND c1.concept_code = 'OMOP4676540' -- Aspirin 100 MG Oral Tablet [Bayer Aspirin]
10 ORDER BY rel.relationship_id
```

ex. 定量値が出る検査(ex.LDL)の関連コンセプト

- Contained in panel: どのパネルにこのコンセプト(検査)は含まれるのか

9 rows returned in 1.5s

T_relationship_id	T_any_value(c2.vocabulary_id)	T_any_value(c2.concept_code)	T_any_value(c2.concept_name)	T_any_value(c2.concept_class_id)
Concept replaces	LOINC	2090-9	Deprecated Cholesterol.in LDL [Mass/volume] i...	Lab Test
Contained in panel	LOINC	39229-0	Lipid screen test status CPHS	Claims Attachment
Has component	LOINC	LP15491-1	Cholesterol in LDL	LOINC Component
Has property	LOINC	LP6827-2	Mass Concentration	LOINC Property
Has scale type	LOINC	LP7753-9	Qn	LOINC Scale
Has system	LOINC	LP7576-4	Serum or Plasma	LOINC System
Has time aspect	LOINC	LP6960-1	Point in time (spot)	LOINC Time
Is a	LOINC	CHEM	Chemistry	LOINC Class
Mapped from	LOINC	2090-9	Deprecated Cholesterol.in LDL [Mass/volume] i...	Lab Test

```
1 SELECT rel.relationship_id, any_value(c2.vocabulary_id), any_value(c2.concept_code), any_value(c2.concept_name), any_value(c2.concept_class_id)
2 FROM read_csv('CONCEPT.csv') c1
3 INNER JOIN read_csv('CONCEPT_RELATIONSHIP.csv') rel
4 ON rel.concept_id1 = c1.concept_id
5 INNER JOIN read_csv('CONCEPT.csv') c2
6 ON rel.concept_id2 = c2.concept_id
7 AND rel.concept_id1 in rel.concept_id2
8 WHERE c1.vocabulary_id = 'LOINC'
9 AND c1.concept_code = '2090-9' -- Cholesterol in LDL [Mass/volume] in Serum or Plasma
10 GROUP BY rel.relationship_id
11 ORDER BY rel.relationship_id
```

ex. 定性値が出る検査(ex.尿蛋白)の関連コンセプト

Has Answer

- この検査では
どのような訂
正値が出る
のか

※日本の検査と互
換性がない可能性
に留意

23 rows returned in 1.8s

T	relationship_id	123	concept_id	T	concept_name	T	domain_id	T	vocabulary_id	T	concept_class_id	T	standard_concept	T	concept_code
Contained in panel			40760923	HEDIS 2010 Codes to identify nephropathy scr...	Measurement	LOINC		Lab Test		NULL		57814-6			
Contained in panel			40770370	HEDIS 2012, 2013 Codes to identify nephropat...	Measurement	LOINC		Lab Test		NULL		67762-5			
Contained in panel			3040305	HEDIS 2009 Codes to identify nephropathy scr...	Measurement	LOINC		Lab Test		NULL		54041-9			
Contained in panel			1175726	HEDIS 2019 Value Set - Urine Protein Tests	Measurement	LOINC		Lab Test		NULL		90989-5			
Contained in panel			1001583	HEDIS 2020 Value Set - Urine Protein Tests	Measurement	LOINC		Lab Test		NULL		94142-7			
Contained in panel			40763501	HEDIS 2011 Codes to identify nephropathy scr...	Measurement	LOINC		Lab Test		NULL		60446-2			
Contained in panel			44786906	HEDIS 2014, 2015 Value Set - Nephropathy S...	Measurement	LOINC		Lab Test		NULL		74251-0			
Contained in panel			21491095	HEDIS 2016-2018 Value Set - Urine Protein T...	Measurement	LOINC		Lab Test		NULL		79539-3			
Contained in panel			36031512	HEDIS MY 2020 Value Set - Urine Protein Tests	Measurement	LOINC		Lab Test		NULL		96067-4			
Has Answer			45876467	3+	Meas Value	LOINC		Answer		S		LA11843-2			
Has Answer			45881916	2+	Meas Value	LOINC		Answer		S		LA11842-4			
Has Answer			45878548	1+	Meas Value	LOINC		Answer		S		LA11841-6			
Has Answer			45878583	Negative	Meas Value	LOINC		Answer		S		LA6577-6			
Has component			40779250	Protein	Observation	LOINC		LOINC Component		NULL		LP15838-3			
Has property			1015176	Presence or Threshold	Observation	LOINC		LOINC Property		NULL		LP217195-9			
Has scale type			1033749	Ord	Observation	LOINC		LOINC Scale		NULL		LP7751-3			
Has system			1033714	Urine	Observation	LOINC		LOINC System		NULL		LP7681-2			
Has time aspect			1029816	Point in time (spot)	Observation	LOINC		LOINC Time		NULL		LP6960-1			
Is a			40657714	Protein Urine/Urine sed	Measurement	LOINC		LOINC Group		C		LG40870-4			
Is a			45876059	Urinalysis	Measurement	LOINC		LOINC Class		C		UA			
Is a			4211845	Urine protein measurement	Measurement	SNOMED		Procedure		S		57378007			
Is a			37062605	Protein Urine Urinalysis	Measurement	LOINC		LOINC Hierarchy		C		LP402534-4			
Is a			40656427	Protein Presence or Threshold Urine	Measurement	LOINC		LOINC Group		C		LG35161-5			

CONCEPT_RELATIONSHIP

- 元のコード体系にある関連性の定義を活かして標準化
 - ex. LOINC公式サイト¹の尿蛋白 →
- OMOPが独自定義してるわけではないので、元のボキャブラリだけでも同じことはできる
 - ただし標準化された構造で扱えると便利
 - 標準/非標準などOMOP独自定義もある

LOINC		VERSION 2.81
LOINC CODE	LONG COMMON NAME	LOINC STATUS
2887-8	Protein [Presence] in Urine	Active
Part Description		
LP15838-3 Protein		
Protein testing is performed to evaluate and monitor liver and kidney function and to detect and diagnose early kidney damage and various other diseases. Elevated protein levels may also be due to an infection, medication, vigorous exercise, or emotional or physical stress. Body fluids contain many different proteins that serve diverse functions such as transport of nutrients, removal of toxins, control of metabolic processes, and defense against invaders. Testing for protein levels may be done as part of a routine physical, a pregnancy workup, in case of a suspected UTI, as part of a hospital admission, or to evaluate kidney function.		
© Copyright © 2021 Lab Tests Online. All rights reserved.		
Source: Lab Tests Online®		
Fully-Specified Name		
Component	Protein	
Property	PrThr	
Time	Pt	
System	Urine	
Scale	Ord	
Method		
Additional Names		
Long Common Name	Protein [Presence] in Urine	
Short Name	Prot Ur QI	
Display Name	Protein QI (U)	
Consumer Name	Protein, Urine	
Example Answer List: LL6876-8		
Answer	Code	Score
Negative		LA6577-6
© http://snomed.info/sct ID:260385009 Negative (qualifier value)		
1+		LA11841-6
2+		LA11842-4
3+		LA11843-2
Basic Attributes		
Class	UA	
Type	Laboratory	
First Released	Version 1.0	
Last Updated	Version 2.73 (MIN)	
Change Reason	Release 2.78: ANSWER_LIST_TYPE: Answer list update; Previous Releases: The PrThr property is used for LOINC terms whose results are reported using an ordered categorical scale, regardless of whether or not an internal threshold was used to make that determination. This change was approved by the Laboratory LOINC Committee in June 2016.	
Order vs. Observation	Observation	
Common Test Rank	133	
Member of these Panels		
LOINC	Long Common Name	
54037-7	HEDIS 2009 panel	
57820-3	HEDIS 2010 panel	
60442-1	HEDIS 2011 panel	
67767-4	HEDIS 2012 panel	

OHDSI Toolsとコンセプト

- Usagi
 - 標準コンセプトにマッピングできるコード値を特定
 - コンセプト名称や別名を用いコンセプトを特定、それが標準にマッピングできないか探索
- Atlas
 - ダッシュボードや Concept Sets、Cohort Definitionにて多用されている
- Data Quality Dashboard
 - 各テーブルに適切なドメインの標準コンセプトが入っているか、などの品質チェック
- Athena
 - コンセプトの検索・関連性の一覧・ヒエラルキーの表示、etc

コンセプトの解像度が上がると各 OHDSI Toolsが何をしてるか想像しやすくなる