

‘Dude, where’s my graph?’

RDF Data Cubes for Clinical Trials Data.

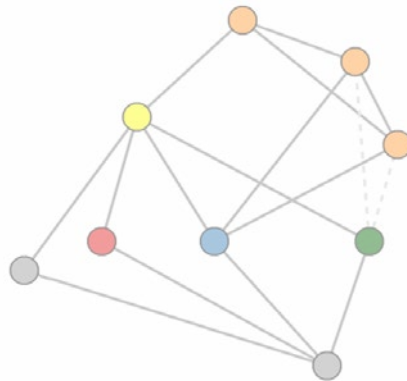


Part I: Graphing RDF with D3.js

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UCB BioSciences Inc, USA

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Part 2: Interactive Summary Tables

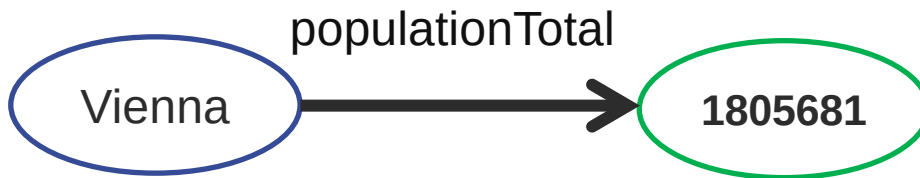
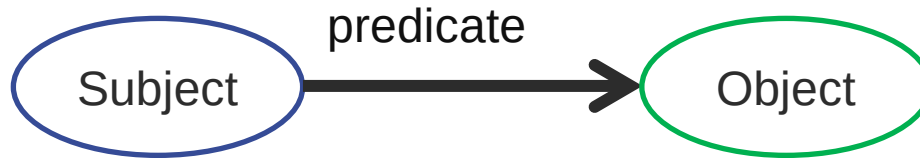
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PhUSE 2015, Vienna

RDF Triples as Directed Graphs



The Reality

Virtuoso SPARQL Query Editor

Default Data Set Name (Graph IRI)

<http://dbpedia.org>

Query Text

```
prefix dbpedia-owl: <http://dbpedia.org/ontology/>
prefix dbres: <http://dbpedia.org/resource/>
SELECT ?s ?p ?o
WHERE {
  <http://dbpedia.org/resource/Vienna> ?p ?o .
  BIND('http://dbpedia.org/resource/Vienna' as ?s)
}
```

Vienna

1805681

populationTotal



Dude,
where's my graph?



http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/elevation	150.876
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/elevation	151.0
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/leaderName	http://dbpedia.org/resource/Maria_Vassilakou
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/leaderName	http://dbpedia.org/resource/Renate_Brauner
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/leaderName	http://dbpedia.org/resource/Michael_Häupl
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/leaderName	http://dbpedia.org/resource/Michael_H%C3%A4upl
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/populationDensity	4326.1
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/populationTotal	"1805681"^^< http://www.w3.org/2001/XMLSchema#integer >
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/timeZone	http://dbpedia.org/resource/Central_European_Summer_Time
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/timeZone	http://dbpedia.org/resource/Central_European_Time
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/utcOffset	"+1"^^< http://www.w3.org/2001/XMLSchema#string >
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/utcOffset	"+2"^^< http://www.w3.org/2001/XMLSchema#string >
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/wikiPageEditLink	http://en.wikipedia.org/w/index.php?title=Vienna&action=edit
http://dbpedia.org/resource/Vienna	http://dbpedia.org/ontology/wikiPageExternalLink	http://whc.unesco.org/en/list/1033

Clinical Trials Results: RDF Data Cube

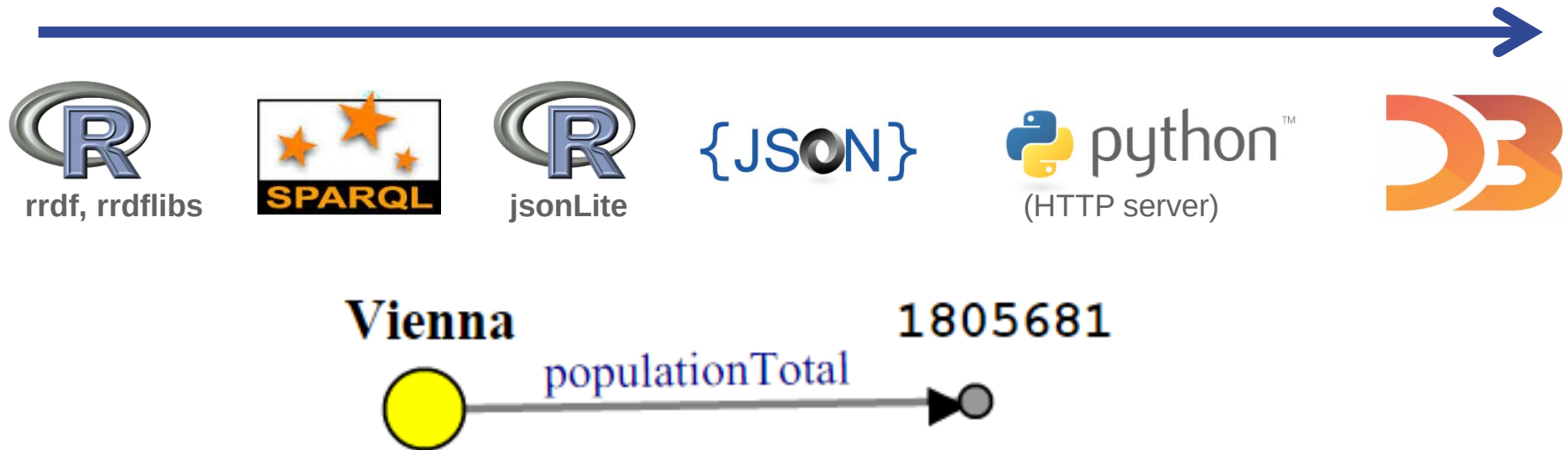
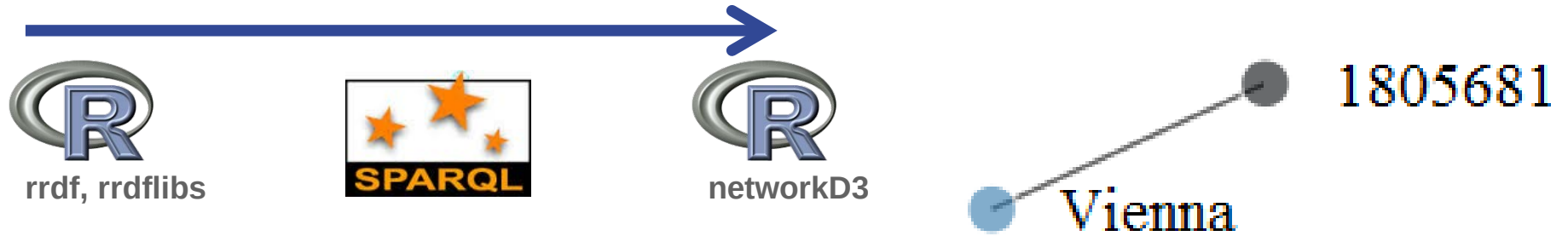
```
@prefix crnd-attribute: <http://www.example.org/dc/attribute#> .
@prefix ds:           <http://www.example.org/dc/demo/ds/> .
@prefix qb:           <http://purl.org/linked-data/cube#> .
@prefix mms:          <http://rdf.cdisc.org/mms#> .
@prefix crnd-dimension: <http://www.example.org/dc/dim
@prefix dct:          <http://purl.org/dc/terms/> .
@prefix rdf:          <http://www.w3.org/1999/02/22-rdf-syntax
@prefix rrdfqbcrnd0: <http://www.example.org/rrdfqbcrnd0/> .
@prefix dcat:          <http://www.w3.org/ns/dcat#> .
@prefix prov:          <http://www.w3.org/ns/prov#> .
```

```
ds:obs113  a                qb:Observation ;
            rdfs:label       "113" ;
            qb:dataset        ds:dataset-DEMO ;
            crnd-attribute:cellpartno "1"^^xsd:string ;
            crnd-attribute:colno      "2"^^xsd:string ;
            crnd-attribute:denominator "" ;
            crnd-attribute:rowno      "33"^^xsd:string ;
            crnd-attribute:unit       "NA"^^xsd:string ;
            crnd-dimension:agegr1     code:agegr1- _ALL_ ;
            crnd-dimension:ethnic     code:ethnic- _ALL_ ;
            crnd-dimension:factor     code:factor-weightbl ;
            crnd-dimension:procedure  code:procedure-min ;
            crnd-dimension:race       code:race- _ALL_ ;
            crnd-dimension:sex        code:sex- _ALL_ ;
            crnd-dimension:trt01a     code:trt01a-Xanomeline_Low_Dose ;
            crnd-measure:measure      "45.4"^^xsd:double .
```

Dude,
seriously!!



Using R to obtain and graph triples



Data Visualization with D3.js (d3js.org)

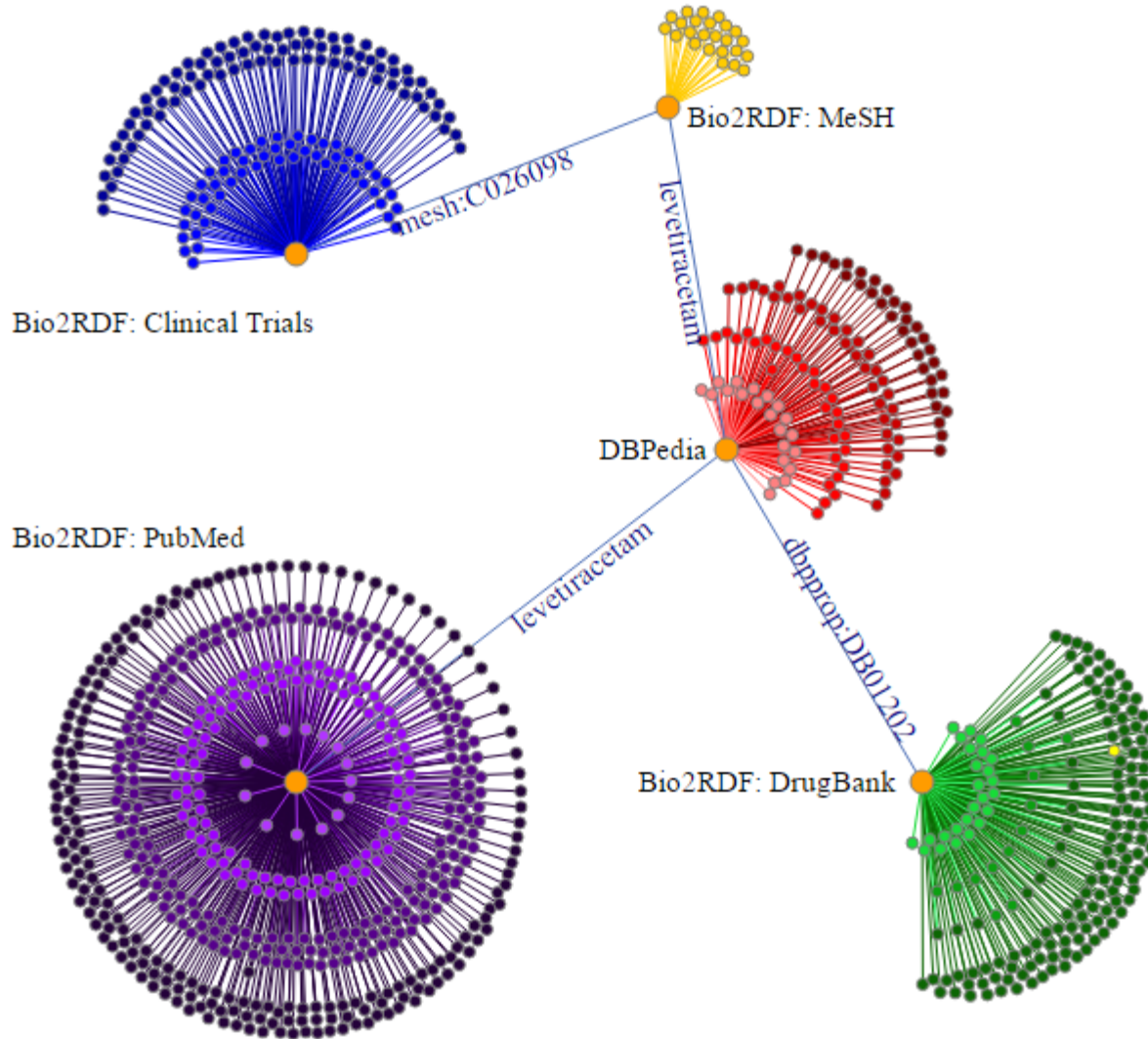
[Overview](#)
[Examples](#)
[Documentation](#)
[Source](#)

Fork me on GitHub



Federated Query Visualization

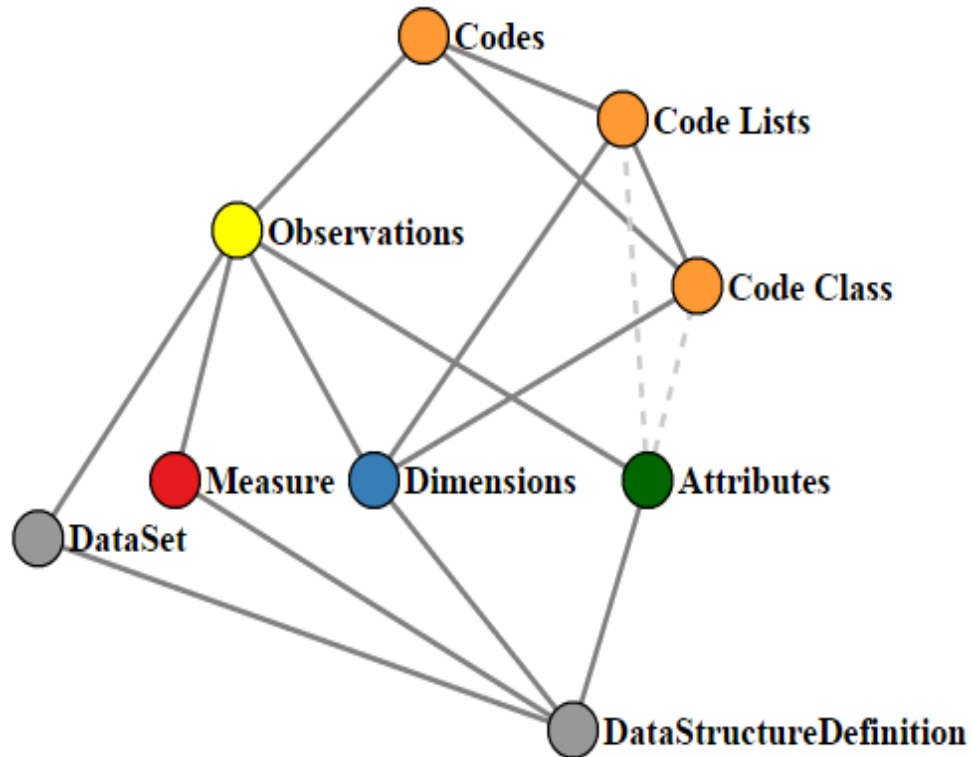
Levetiracetam



[LiveGraph](#)

[Webm Link](#)

RDF Data Cube: High-Level Structure



[LiveGraph](#)

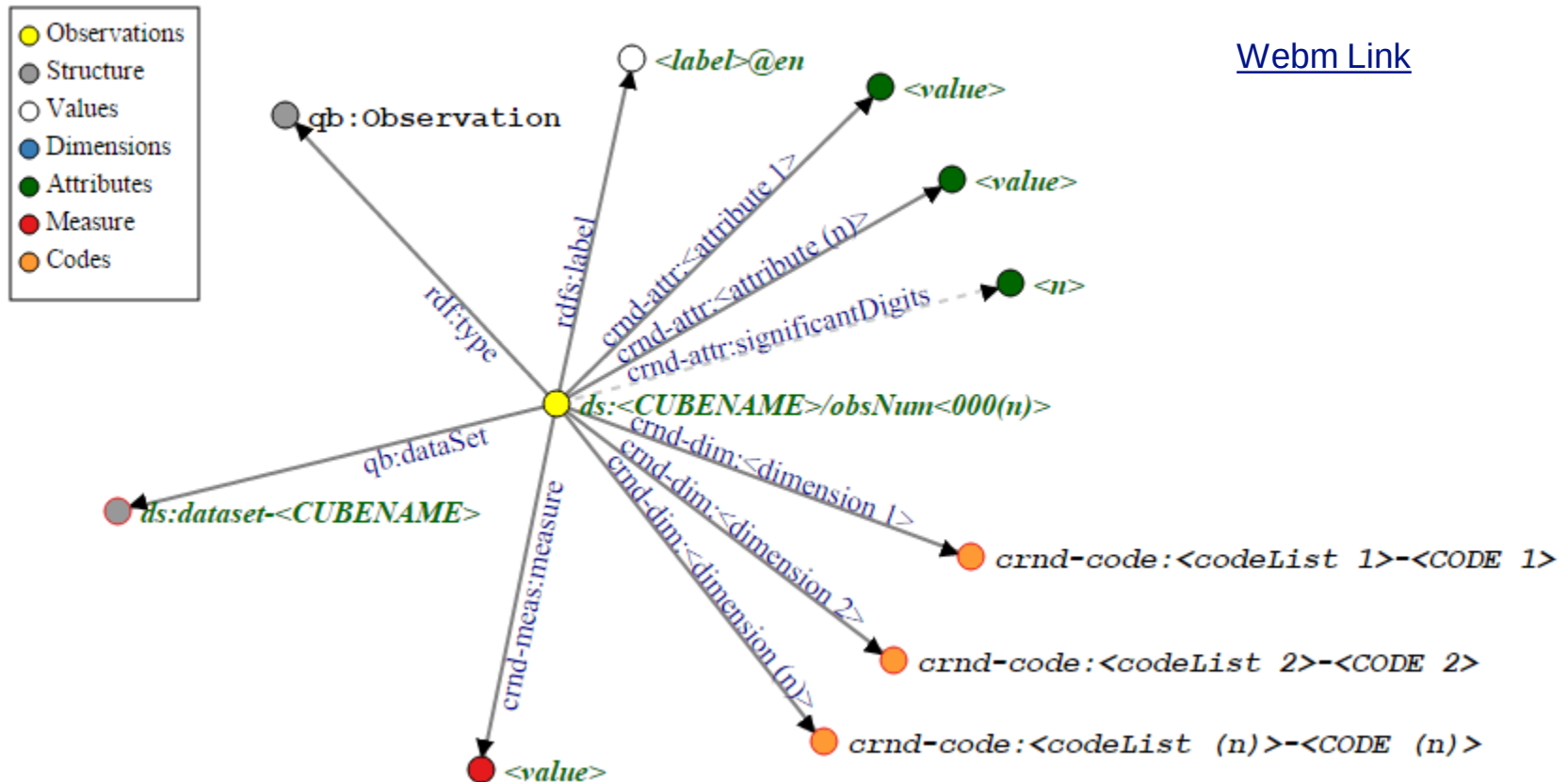
[Webm link](#)

RDF Data Cube: qb:Observation Model

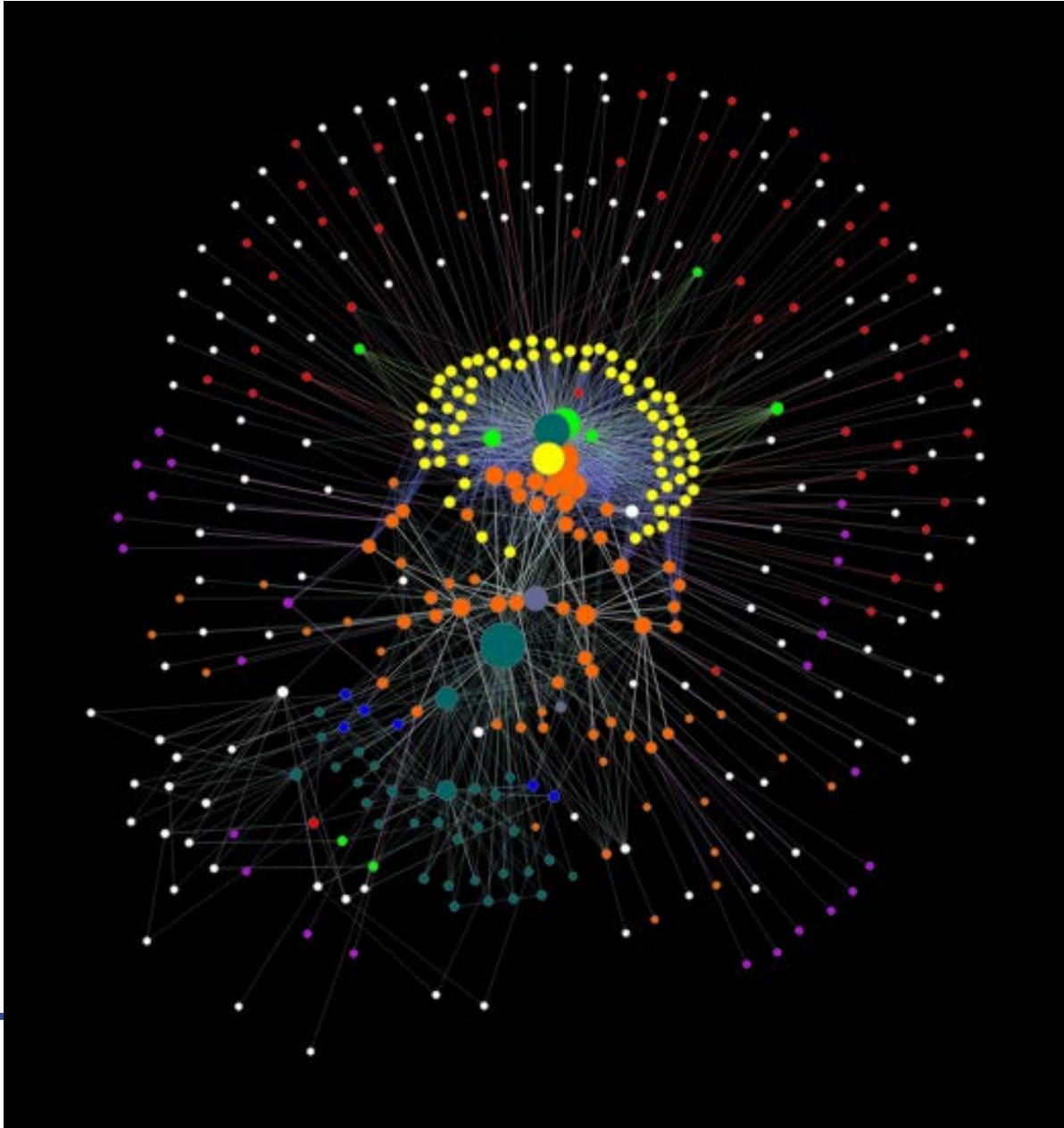
[LiveGraph](#)

[Webm Link](#)

Cube Structure: qb:Observation



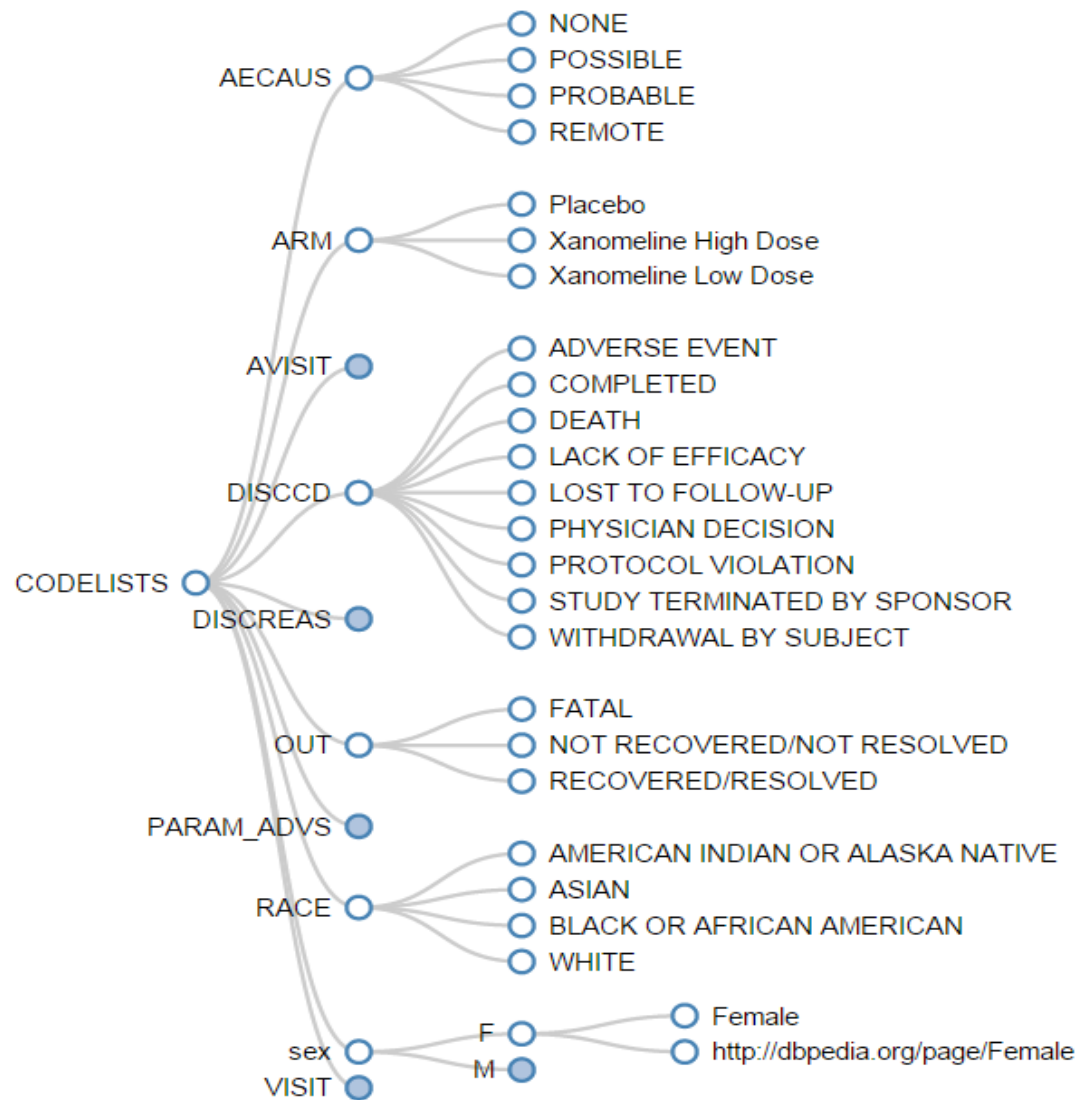
RDF Data Cube: Demographics



[LiveGraph](#)

[Websm Link](#)

RDF Code Lists Interactive Visualization



[LiveGraph](#)

[webSM Link](#)

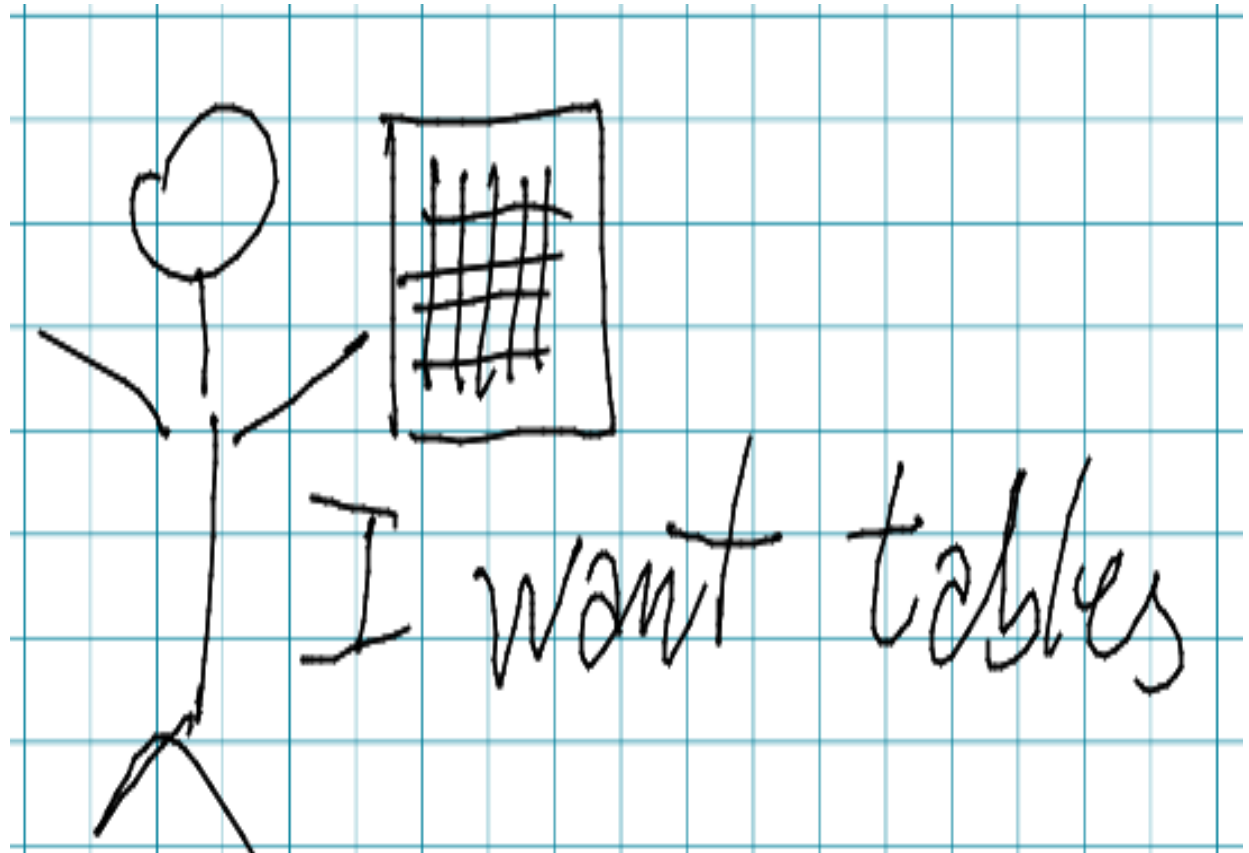
***Everything* is a graph!**

But there is more than graphs!



Part II : Interactive Summary Tables

Presented by Marc Andersen, StatGroup ApS



The interface

- Left side: Actions
- Right side: Results
- Build using HTML and javascript
- Shows HTML pages using iframe
- SPARQL queries to a triple store
- Rendition of SPARQL query results
- RDF data cube created in R
- HTML version of cube in row-column format with href corresponding to the underlying RDF object
- Drag and drop links to the actions on the left

Describe

Dimensions

Data

Copy

Trial List

Disposition

Demographics

AEs

MainSub part 1Sub part 2

dsd-DEMO

Age group	Race	Ethnic	Sex (Gender)	Variable	Statistics	Placebo	Xanomeline Low Dose	Xanomeline High Dose	
ALL	ALL	ALL	NONMISS	quantity-proportion	count-percent	86	100.0	84	100.0
ALL	ALL	ALL	F	quantity-proportion	count-percent	53	61.6	50	47.6
ALL	ALL	ALL	M	quantity-proportion	count-percent	33	38.4	34	40.5
ALL	ALL	ALL	ALL	age	std	8.6	8.3	7.9	
ALL	ALL	ALL	ALL	age	n	86	84	84	
ALL	ALL	ALL	ALL	age	median	76.0	77.5	76.0	
ALL	ALL	ALL	ALL	age	mean	75.2	75.7	74.4	
ALL	ALL	ALL	ALL	age	q3	82.0	82.0	80.0	
ALL	ALL	ALL	ALL	age	q1	69.0	71.0	70.5	
ALL	ALL	ALL	ALL	age	max	89.0	88.0	88.0	
ALL	ALL	ALL	ALL	age	min	52.0	51.0	56.0	
NONMISS	ALL	ALL	ALL	quantity-proportion	count-percent	86	100.0	84	100.0
≤65	ALL	ALL	ALL	quantity-proportion	count-percent	14	16.3	8	9.5
65-80	ALL	ALL	ALL	quantity-proportion	count-percent	42	48.8	47	56.5
≥80	ALL	ALL	ALL	quantity-proportion	count-percent	30	34.9	29	34.5
ALL	NONMISS	ALL	ALL	quantity-proportion	count-percent	86	100.0	84	100.0
ALL	WHITE	ALL	ALL	quantity-proportion	count-percent	28	30.7	28	32.9
ALL	BLACK OR AFRICAN AMERICAN	ALL	ALL	quantity-proportion	count-percent	8	9.3	6	7.1
ALL	AMERICAN INDIAN OR ALASKA NATIVE	ALL	ALL	quantity-proportion	count-percent	0	0.0	0	0.0

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Note Linked Data Server specific – other servers can be used, or other ways of displaying the result.

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Action: Describe

Describe	Main	Sub part 1	Sub part 2
Dimensions			
Data			
Copy			
Trial List			
Disposition			
Demographics			
AEs			

dsd-DEMO

Age group	Race	Ethnic	Sex (Gender)	Variable	Statistics	Placebo		Xanomeline Low Dose		Xanomeline High Dose	
ALL	ALL	ALL	NONMISS	quantity, proportion	count, percent	86	100.0	84	100.0	84	100.0
ALL	ALL	ALL	F	quantity, proportion	count, percent	53	61.6	50	59.5	40	47.6
ALL	ALL	ALL	M	quantity, proportion	count, percent	33	38.4	34	40.5	44	52.4
ALL	ALL	ALL	ALL	age.	std.	8.6		8.3		7.9	
ALL	ALL	ALL	ALL	age.	n.	86		84		84	
ALL	ALL	ALL	ALL	age.	median.	76.0		77.5		76.0	
ALL	ALL	ALL	ALL	age.	mean.	75.7		75.7		74.4	
ALL	ALL	ALL	ALL	age.	q3.	82.0		82.0		80.0	
ALL	ALL	ALL	ALL	age.	q1.	69.0		71.0		70.5	
ALL	ALL	ALL	ALL	age.	max.	89.0		88.0		88.0	
ALL	ALL	ALL	ALL	age.	min.	52.0		51.0		56.0	
NONMISS	ALL	ALL	ALL	quantity, proportion	count, percent	86	100.0	84	100.0	84	100.0
<65	ALL	ALL	ALL	quantity, proportion	count, percent	14	16.3	8	9.5	11	13.1
65-80	ALL	ALL	ALL	quantity, proportion	count, percent	42	48.8	47	56.0	55	65.5
>80	ALL	ALL	ALL	quantity, proportion	count, percent	30	34.9	29	34.5	18	21.4
ALL	NONMISS	ALL	ALL	quantity, proportion	count, percent	86	100.0	84	100.0	84	100.0
ALL	WHITE	ALL	ALL	quantity, proportion	count, percent	78	90.7	78	92.9	74	88.1
ALL	BLACK OR AFRICAN AMERICAN	ALL	ALL	quantity, proportion	count, percent	8	9.3	6	7.1	9	10.7
ALL	AMERICAN INDIAN OR ALASKA NATIVE	ALL	ALL	quantity, proportion	count, percent	0	0.0	0	0.0	1	1.2
ATT	ATT	ATT	ATT	variable	std	12.8		14.1		14.7	

Action: Dimensions

Dropping an observation

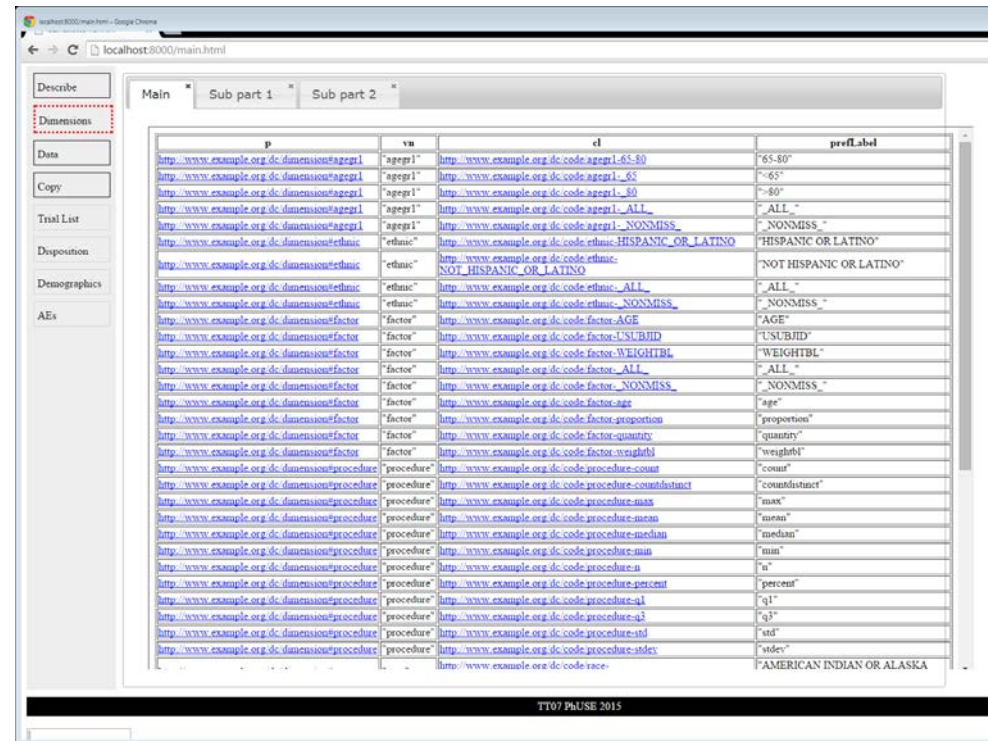
- shows all dimensions with code lists

Dropping a dimension

- shows only the dimension

Result of a SPARQL query displayed as the html

returned from the SPARQL endpoint (Virtuoso)



p	vn	el	prefLabel
http://www.example.org/dc/dimension/agegr1	agegr1	http://www.example.org/dc/code/agegr1-65-80	"65-80"
http://www.example.org/dc/dimension/agegr1	agegr1	http://www.example.org/dc/code/agegr1-65	"~65"
http://www.example.org/dc/dimension/agegr1	agegr1	http://www.example.org/dc/code/agegr1-80	"~80"
http://www.example.org/dc/dimension/agegr1	agegr1	http://www.example.org/dc/code/agegr1-ALL	"ALL"
http://www.example.org/dc/dimension/agegr1	agegr1	http://www.example.org/dc/code/agegr1-NONMISS	"NONMISS"
http://www.example.org/dc/dimension/ethnic	ethnic	http://www.example.org/dc/code/ethnic-HISPANIC_OR_LATINO	"HISPANIC OR LATINO"
http://www.example.org/dc/dimension/ethnic	ethnic	http://www.example.org/dc/code/ethnic-NOT_HISPANIC_OR_LATINO	"NOT HISPANIC OR LATINO"
http://www.example.org/dc/dimension/ethnic	ethnic	http://www.example.org/dc/code/ethnic-ALL	"ALL"
http://www.example.org/dc/dimension/ethnic	ethnic	http://www.example.org/dc/code/ethnic-NONMISS	"NONMISS"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-AGE	"AGE"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-USUBJID	"USUBJID"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-WEIGHTBL	"WEIGHTBL"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-ALL	"ALL"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-NONMISS	"NONMISS"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-age	"age"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-proportion	"proportion"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-quantity	"quantity"
http://www.example.org/dc/dimension/factor	factor	http://www.example.org/dc/code/factor-weightbl	"weightbl"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-count	"count"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-countdistinct	"countdistinct"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-max	"max"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-mean	"mean"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-median	"median"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-min	"min"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-n	"n"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-percent	"percent"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-q1	"q1"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-q3	"q3"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-std	"std"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/procedure-stddev	"stddev"
http://www.example.org/dc/dimension/procedure	procedure	http://www.example.org/dc/code/race	"AMERICAN INDIAN OR ALASKA"

Action: Dimensions

localhost:8000/main.html

Describe

Dimensions

Data

Copy

Trial List

Disposition

Demographics

AEs

Main

Sub part 1

Sub part 2

dsd-DEMO

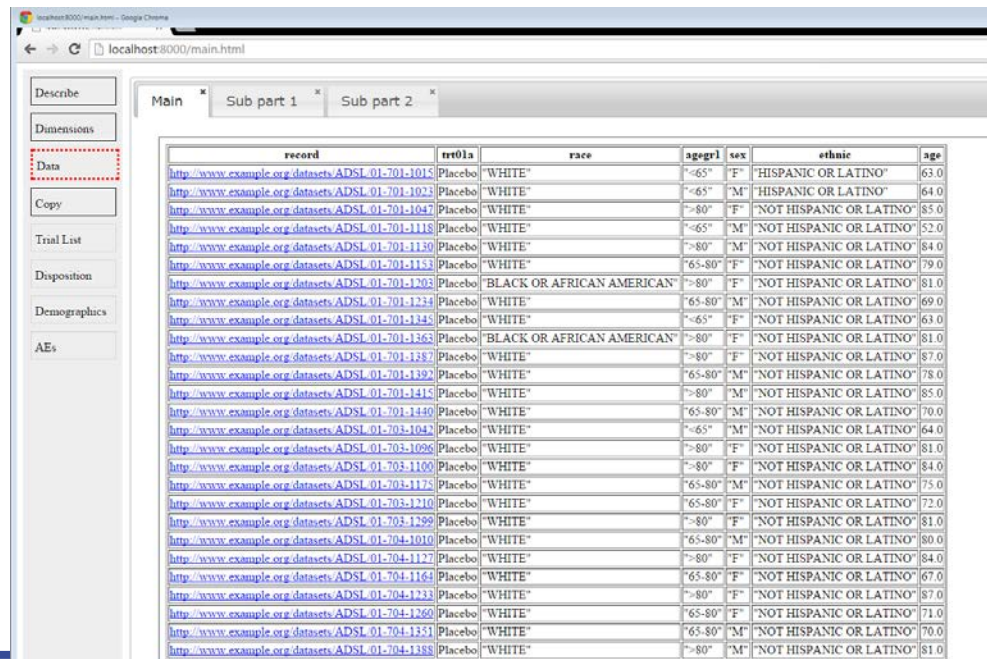
Age group	Race	Ethnic	Sex (Gender)	Variable	Statistics	Placebo		Xanomeline Low Dose		Xanomeline High Dose	
ALL	ALL	ALL	NONMISS	quantity. proportion	count. percent	86	100.0	84	100.0	84	100.0
ALL	ALL	ALL	F	quantity. proportion	count. percent	53	61.6	50	59.5	40	47.6
ALL	ALL	ALL	M	quantity. proportion	count. percent	33	38.4	34	40.5	44	52.4
ALL	ALL	ALL	ALL	age.	std.	8.6		8.3		7.9	
ALL	ALL	ALL	ALL	age.	n.	86		84		84	
ALL	ALL	ALL	ALL	age.	median.	76.0		77.5		76.0	
ALL	ALL	ALL	ALL	age.	mean.	75.2		75.7		74.4	
ALL	ALL	ALL	ALL	age.	q3.	82.0		82.0		80.0	
ALL	ALL	ALL	ALL	age.	q1.	69.0		71.0		70.5	
ALL	ALL	ALL	ALL	age.	max.	89.0		88.0		88.0	
ALL	ALL	ALL	ALL	age.	min.	52.0		51.0		56.0	
NONMISS	ALL	ALL	ALL	quantity. proportion	count. percent	86	100.0	84	100.0	84	100.0
<65	ALL	ALL	ALL	quantity. proportion	count. percent	14	16.3	8	9.5	11	13.1
65-80	ALL	ALL	ALL	quantity. proportion	count. percent	42	48.8	47	56.0	55	65.5
>80	ALL	ALL	ALL	quantity. proportion	count. percent	30	34.9	29	34.5	18	21.4
ALL	NONMISS	ALL	ALL	quantity. proportion	count. percent	86	100.0	84	100.0	84	100.0
ALL	WHITE	ALL	ALL	quantity. proportion	count. percent	78	90.7	78	92.9	74	88.1

Action: Data

Dropping an observation

- Builds SPARQL query to retrieve underlying data using JavaScript
- Present received data as a table using JavaScript
- Drag URI to Action describe to invoke faceted browser

Instead of showing a table, the data can be visualized using, say, d3js



record	ttr01a	race	agegr1	sex	ethnic	age
http://www.example.org/datasets/ADSL_01-701-1015	Placebo	"WHITE"	"<65"	"F"	"HISPANIC OR LATINO"	63.0
http://www.example.org/datasets/ADSL_01-701-1023	Placebo	"WHITE"	"<65"	"M"	"HISPANIC OR LATINO"	64.0
http://www.example.org/datasets/ADSL_01-701-1047	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	85.0
http://www.example.org/datasets/ADSL_01-701-1118	Placebo	"WHITE"	"<65"	"M"	"NOT HISPANIC OR LATINO"	52.0
http://www.example.org/datasets/ADSL_01-701-1130	Placebo	"WHITE"	">80"	"M"	"NOT HISPANIC OR LATINO"	84.0
http://www.example.org/datasets/ADSL_01-701-1153	Placebo	"WHITE"	"65-80"	"F"	"NOT HISPANIC OR LATINO"	79.0
http://www.example.org/datasets/ADSL_01-701-1203	Placebo	"BLACK OR AFRICAN AMERICAN"	">80"	"F"	"NOT HISPANIC OR LATINO"	81.0
http://www.example.org/datasets/ADSL_01-701-1224	Placebo	"WHITE"	"65-80"	"M"	"NOT HISPANIC OR LATINO"	69.0
http://www.example.org/datasets/ADSL_01-701-1345	Placebo	"WHITE"	"<65"	"F"	"NOT HISPANIC OR LATINO"	63.0
http://www.example.org/datasets/ADSL_01-701-1363	Placebo	"BLACK OR AFRICAN AMERICAN"	">80"	"F"	"NOT HISPANIC OR LATINO"	81.0
http://www.example.org/datasets/ADSL_01-701-1387	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	87.0
http://www.example.org/datasets/ADSL_01-701-1392	Placebo	"WHITE"	"65-80"	"M"	"NOT HISPANIC OR LATINO"	78.0
http://www.example.org/datasets/ADSL_01-701-1415	Placebo	"WHITE"	">80"	"M"	"NOT HISPANIC OR LATINO"	85.0
http://www.example.org/datasets/ADSL_01-701-1440	Placebo	"WHITE"	"65-80"	"M"	"NOT HISPANIC OR LATINO"	70.0
http://www.example.org/datasets/ADSL_01-703-1042	Placebo	"WHITE"	"<65"	"M"	"NOT HISPANIC OR LATINO"	64.0
http://www.example.org/datasets/ADSL_01-703-1096	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	81.0
http://www.example.org/datasets/ADSL_01-703-1100	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	84.0
http://www.example.org/datasets/ADSL_01-703-1175	Placebo	"WHITE"	"65-80"	"M"	"NOT HISPANIC OR LATINO"	75.0
http://www.example.org/datasets/ADSL_01-703-1210	Placebo	"WHITE"	"65-80"	"F"	"NOT HISPANIC OR LATINO"	72.0
http://www.example.org/datasets/ADSL_01-703-1299	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	81.0
http://www.example.org/datasets/ADSL_01-704-1010	Placebo	"WHITE"	"65-80"	"M"	"NOT HISPANIC OR LATINO"	80.0
http://www.example.org/datasets/ADSL_01-704-1127	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	84.0
http://www.example.org/datasets/ADSL_01-704-1164	Placebo	"WHITE"	"65-80"	"F"	"NOT HISPANIC OR LATINO"	67.0
http://www.example.org/datasets/ADSL_01-704-1233	Placebo	"WHITE"	">80"	"F"	"NOT HISPANIC OR LATINO"	87.0
http://www.example.org/datasets/ADSL_01-704-1260	Placebo	"WHITE"	"65-80"	"F"	"NOT HISPANIC OR LATINO"	71.0
http://www.example.org/datasets/ADSL_01-704-1351	Placebo	"WHITE"	"65-80"	"M"	"NOT HISPANIC OR LATINO"	70.0
http://www.example.org/datasets/ADSL_01-704-1388	Placebo	"WHITE"	">80"	"M"	"NOT HISPANIC OR LATINO"	81.0

Action: Data

← → ↻ localhost:8000/main.html

Describe
Dimensions
Data
Copy
Trial List
Disposition
Demographics
AEs

Main * Sub part 1 * Sub part 2 *

dsd-DEMO

Age group	Race	Ethnic	Sex (Gender)	Variable	Statistics	Placebo		Xanomeline Low Dose		Xanomeline High Dose	
ALL	ALL	ALL	NONMISS	quantity proportion	count percent	86	100.0	84	100.0	84	100.0
ALL	ALL	ALL	F	quantity proportion	count percent	53	61.6	50	59.5	40	47.6
ALL	ALL	ALL	M	quantity proportion	count percent	33	38.4	34	40.5	44	52.4
ALL	ALL	ALL	ALL	age	std.	8.6		8.3		7.9	
ALL	ALL	ALL	ALL	age	n.	86		84		84	
ALL	ALL	ALL	ALL	age	median	76.0		77.5		76.0	
ALL	ALL	ALL	ALL	age	mean	75.2		75.7		74.4	
ALL	ALL	ALL	ALL	age	q3	82.0		82.0		80.0	
ALL	ALL	ALL	ALL	age	q1	69.0		71.0		70.5	
ALL	ALL	ALL	ALL	age	max	89.0		88.0		88.0	
ALL	ALL	ALL	ALL	age	min	52.0		51.0		56.0	
NONMISS	ALL	ALL	ALL	quantity proportion	count percent	86	100.0	84	100.0	84	100.0
≤65	ALL	ALL	ALL	quantity proportion	count percent	14	16.3	8	9.5	11	13.1
65-80	ALL	ALL	ALL	quantity proportion	count percent	42	48.8	47	56.0	55	65.5
>80	ALL	ALL	ALL	quantity proportion	count percent	30	34.9	29	34.5	18	21.4
ALL	NONMISS	ALL	ALL	quantity proportion	count percent	86	100.0	84	100.0	84	100.0
ALL	WHITE	ALL	ALL	quantity	count	78	90.7	78	92.9	74	88.1

Action: Copy

Dropping an observation

- copies the text representation and the URI for the object to the clipboard
- pasted into any application understanding text/HTML, e.g. Microsoft Word

Technical issue: have to use Ctrl-C to copy to clipboard. Clipboard functionality is defined in HTML5, but works slightly different in each browser. So may need a specialized browser?

The screenshot shows a web browser window displaying a clinical trial data table titled "dsd-DEMO". The table has columns for Age group, Race, Ethnic, Sex (Gender), Variable, Statistics, and three dose groups: Placebo, Xanomeline Low Dose, and Xanomeline High Dose. The data is organized into rows for different age groups and variables.

Age group	Race	Ethnic	Sex (Gender)	Variable	Statistics	Placebo	Xanomeline Low Dose	Xanomeline High Dose
ALL	ALL	ALL	NONMISS	quantity, proportion	count, percent	86 100.0	84 100.0	84 100.0
ALL	ALL	ALL	E	quantity, proportion	count, percent	53 61.6	50 59.5	40 47.6
ALL	ALL	ALL	M	quantity, proportion	count, percent	33 38.4	34 40.5	44 52.4
ALL	ALL	ALL	ALL	age, std.		8.6	8.3	7.9
ALL	ALL	ALL	ALL	age, n.		86	84	84
ALL	ALL	ALL	ALL	age, median		76.0	77.5	76.0
ALL	ALL	ALL	ALL	age, mean		75.2	75.7	74.4
ALL	ALL	ALL	ALL	age, q3		82.0	83.0	80.0
ALL	ALL	ALL	ALL	age, q1		69.0	71.0	70.5
ALL	ALL	ALL	ALL	age, max		89.0	88.0	88.0
ALL	ALL	ALL	ALL	age, min		52.0	51.0	56.0

Below the table, a Microsoft Word document titled "Document1 - Word" is open, showing the text: "In the Placebo group the median age was 76.0 year." A tooltip indicates that the text was copied from the table.

Describe

Dimensions

Data

Copy

Trial List

Disposition

Demographics

AEs

Main

Sub part 1

Sub part 2

dsd-DEMO

Age group	Race	Ethnic	Sex (Gender)	Variable	Statistics	Placebo		Xanomeline Low Dose		Xanomeline High Dose	
ALL	ALL	ALL	NONMISS	quantity. proportion	count. percent	86	100.0	84	100.0	84	100.0
ALL	ALL	ALL	F	quantity. proportion	count. percent	53	61.6	50	59.5	40	47.6
ALL	ALL	ALL	M	quantity. proportion	count. percent	33	38.4	34	40.5	44	52.4
ALL	ALL	ALL	ALL	age.	std.	8.6		8.3		7.9	
ALL	ALL	ALL	ALL	age.	n.	86		84		84	
ALL	ALL	ALL	ALL	age.	median.	76.0		77.5		76.0	
ALL	ALL	ALL	ALL	age.	mean.	75.2		75.7		74.4	
ALL	ALL	ALL	ALL	age.	q3.	82.0		82.0		80.0	
ALL	ALL	ALL	ALL	age.	q1.	69.0		71.0		70.5	
ALL	ALL	ALL	ALL	age.	max.	89.0		88.0		88.0	
ALL	ALL	ALL	ALL	age.	min.	52.0		51.0		56.0	
NONMISS	ALL	ALL	ALL	quantity. proportion	count. percent	86	100.0	84	100.0	84	100.0
<65	ALL	ALL	ALL	quantity. proportion	count. percent	14	16.3	8	9.5	11	13.1
65-80	ALL	ALL	ALL	quantity. proportion	count. percent	42	48.8	47	56.0	55	65.5
>80	ALL	ALL	ALL	quantity. proportion	count. percent	30	34.9	29	34.5	18	21.4
ALL	NONMISS	ALL	ALL	quantity. proportion	count. percent	86	100.0	84	100.0	84	100.0
ALL	WHITE	ALL	ALL	quantity. proportion	count. percent	78	90.7	78	92.9	74	88.1
ALL	BLACK OR AFRICAN AMERICAN	ALL	ALL	quantity. proportion	count. percent	8	9.3	6	7.1	9	10.7
ALL	AMERICAN INDIAN OR ALASKA NATIVE	ALL	ALL	quantity. proportion	count. percent	0	0.0	0	0.0	1	1.2
ALL	ALL	ALL	ALL	quantity. proportion	count. percent	12.8		14.1		14.7	

Ongoing in PhUSE Semantic Technology Project

Modeling Analysis Results & Metadata to
Support Clinical and Non-Clinical Applications

Analysis Results Model – see

http://www.phusewiki.org/wiki/index.php?title=Analysis_Results_Model

Technical specification of the cube model

- In Draft 1 – July 31, 2015. Review and discussion ongoing

R package

- Rewrite to match Tech Spec Draft 1, split into smaller packages, move to PhUSE.org GitHub

White Paper for considerations and benefits of modeling Analysis Results & Metadata in RDF

- Draft written, in process

New Project suggestions:

Concise specification of tables for descriptive statistics using metadata – inspiration for syntax/formular from

SAS PROC Tabulate

R packages tables (<https://cran.r-project.org/web/packages/tables/index.html>)

Tabular representation for inclusion in CSR of analysis results using meta data

Conclusion

* Display graphs

* Present tables

Linked data methods are feasible

Graphs and visualization

- Offers new perspectives and possibilities for data presentation
- Technically interesting & visually appealing
- Practically feasible in another scale than with other methods – more data sources can be combined and presented
- Visualization and linked data goes well together

Interactive summary tables

- Possible to use linked data principles when reporting clinical data
- Facilitates traceability – a URI for each result provides context
- Potential to enhance both creation and review of CSR

Thank you!

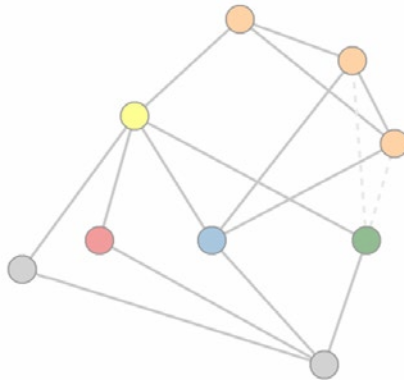


Part I: Graphing RDF with D3.js

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Part 2: Interactive Summary Tables

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