



European Medical Information Framework

Introduction
29 April 2016



Our Vision



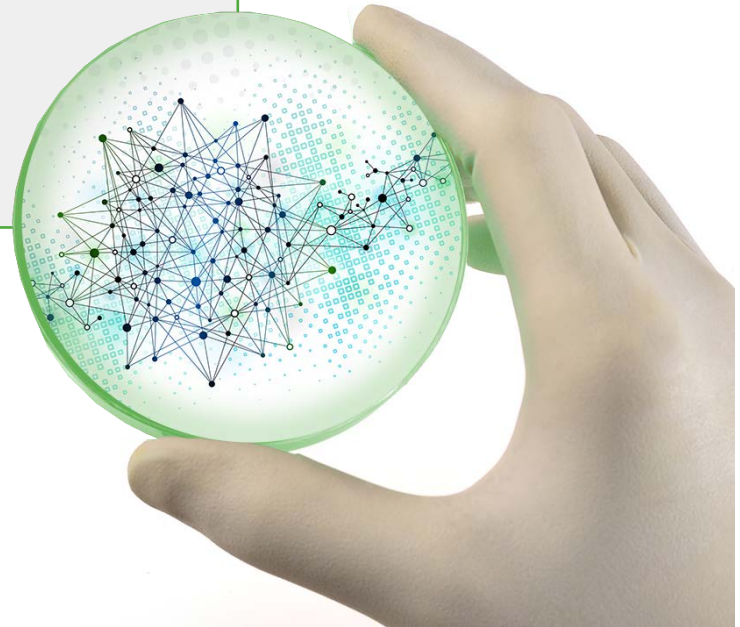
*To be the trusted European hub
for health care data
intelligence, enabling new
insights into diseases and
treatments*

EMIF supports flow from:

Data Discovery

└─▶ Data Assessment

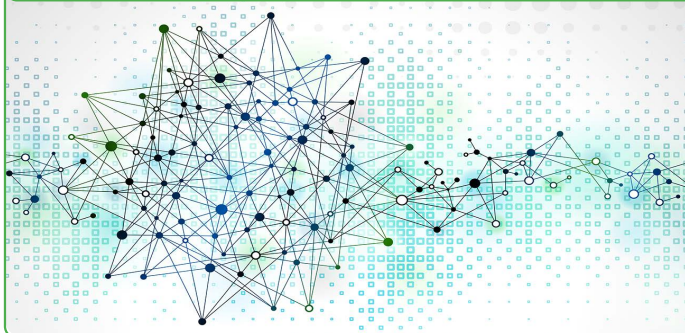
└─▶ Data Reuse



Project objectives



EMIF-Platform



Develop a framework for evaluating, enhancing and providing access to human health data across Europe, support EMIF-Metabolic and EMIF-AD (the specific topics below) as well as support research using human health data in general

Mid Term Review meeting 15/04/2016 7

EMIF-Metabolic



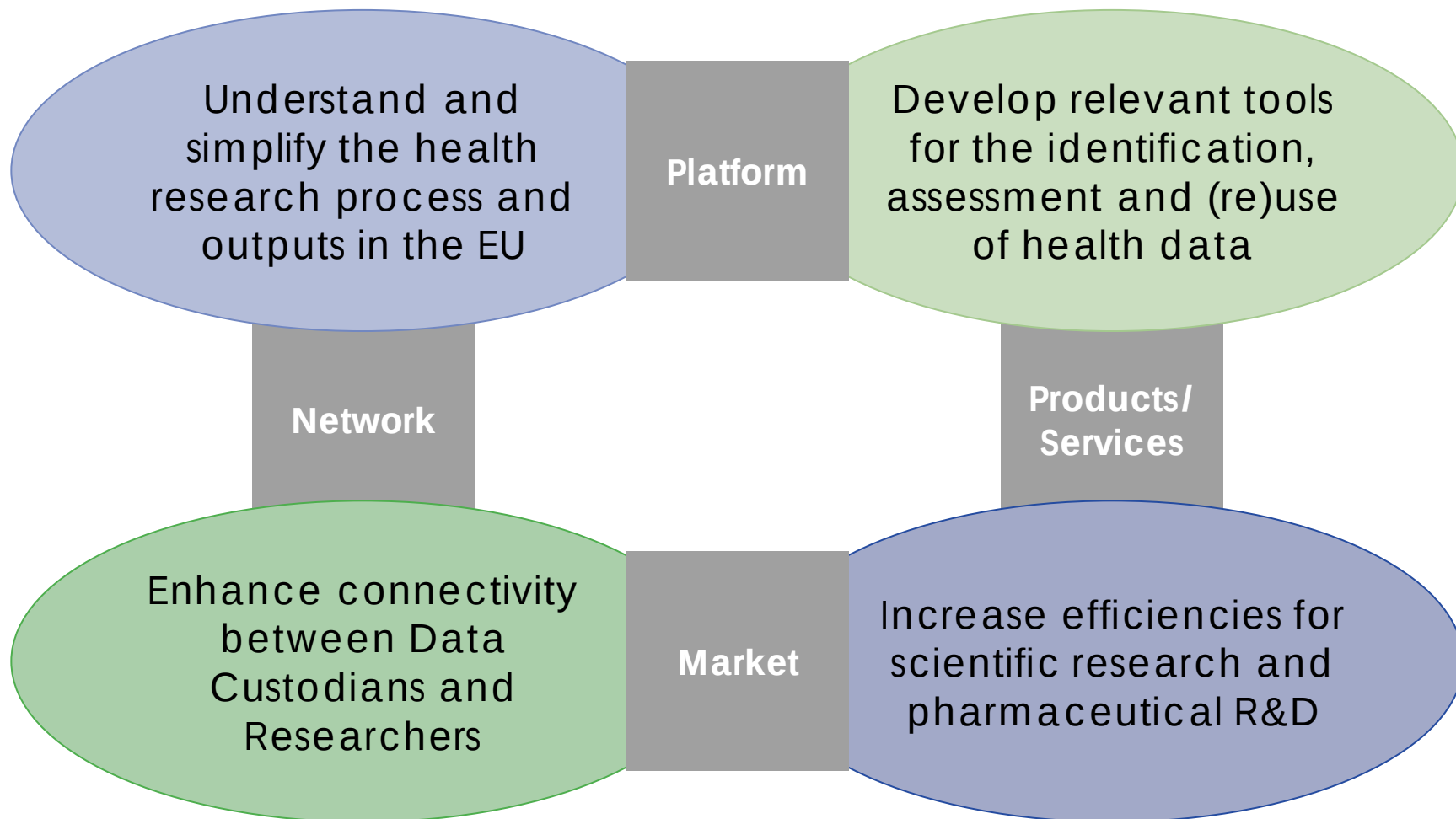
Identify predictors of metabolic complications in obesity

EMIF-AD

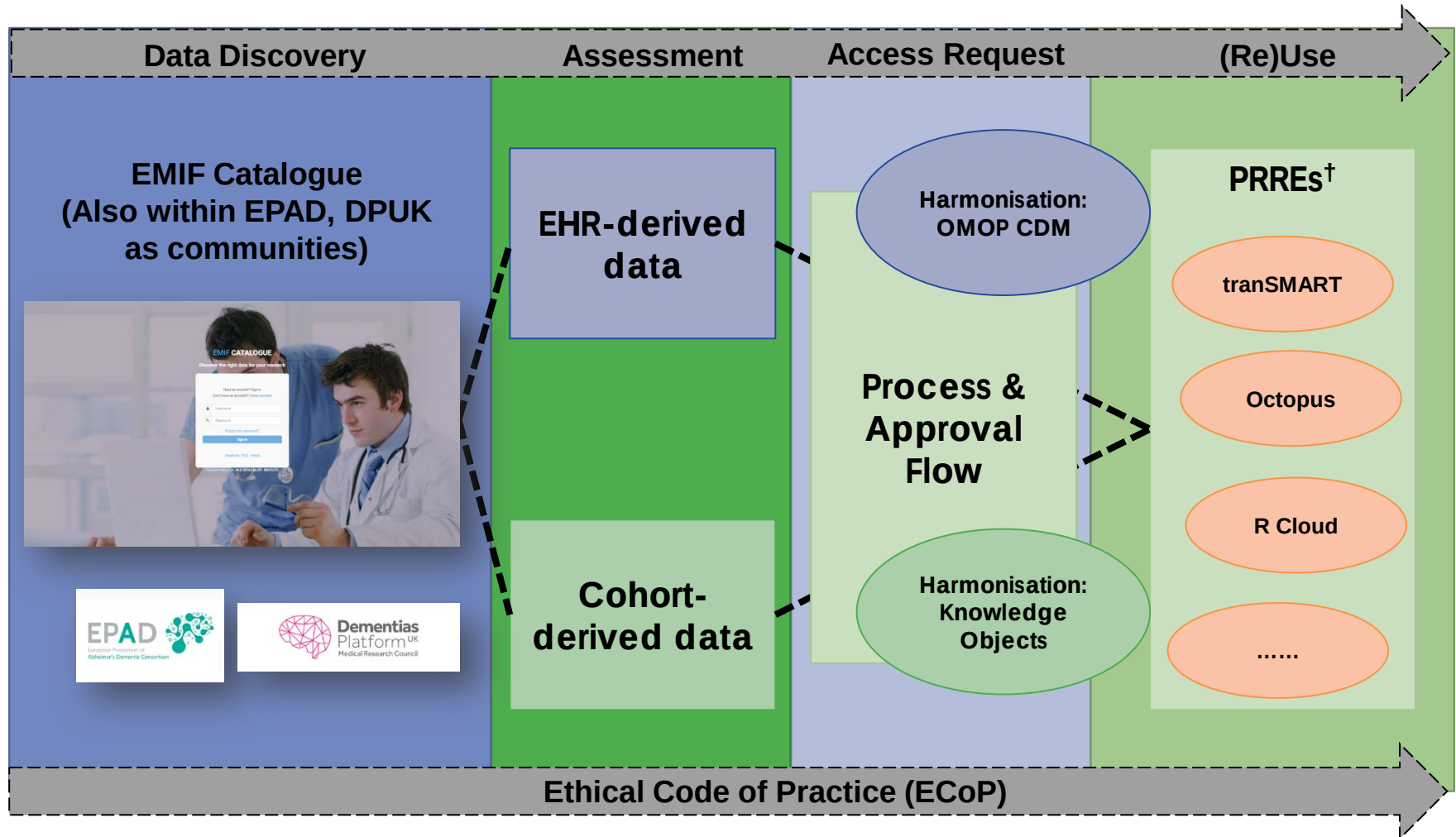


Identify predictors of Alzheimer's Disease (AD) in the pre-clinical and prodromal phase

What is EMIF trying to achieve?



EMIF; enabling the data to information to knowledge flow



† Private Remote Research Environment

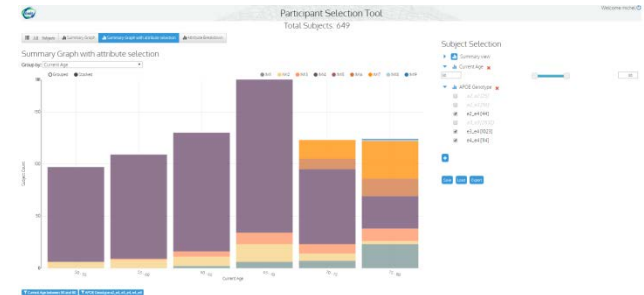
Infrastructure implemented

- discovery, assessment and analysis

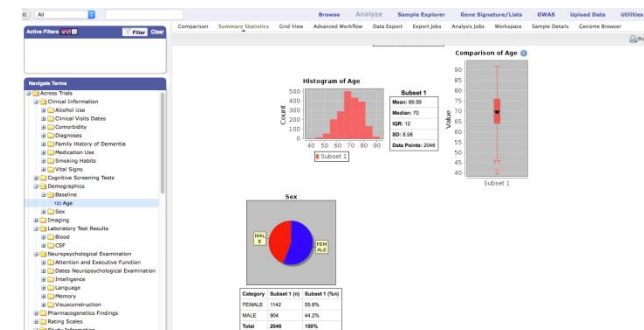


- ❖ Catalogue Tool
 - Identify study variables, size, characteristics
 - E.g. 45 cohorts for AD; ~60,000 research study participants

- ❖ Participant/ Variable Selection Tool
 - Generation of virtual cohorts
 - Value proposition for clinical trials



- ❖ Data analysis tool / TranSMART
 - Pooled analysis of harmonised data



Closer detail on the EMIF Service Framework



Public access

Catalogue
descriptors

On registration

Publicly
accessible
dashboards

Verified users and organisations

Suitability
(data item profiles)

Verified teams and organisations

Research analysis
(data sharing:
centralised or
federated models)

Sign up

EMIF online
communities

Verified organisations

Customised
dashboards

Verified users and organisations

Feasibility
(aggregated
results)

Catalogue - Communities



EMIF Catalogue - Google Chrome
https://emif-catalogue.eu/index

EMIF CATALOGUE

Free text search

Home

Welcome to the EMIF Catalogue

Below you can see existing communities

[REQUEST A NEW COMMUNITY](#)

ELECTRONIC HEALTH RECORD DATA
total 14
EMIF-EHR intends to explore how the massive data available in pan-European EHR systems can improve biomedical research.
[Leave](#) [More](#)
[OPEN](#)

ALZHEIMER'S DISEASE COHORTS
total 45
The overall aim of EMIF-AD is to build an IF for studies on neurodegeneration in order to discover and validate AD biomarkers.
[Leave](#) [More](#)
[OPEN](#)

EPAD
total 18
EPAD aims to develop an infrastructure to undertake adaptive studies for early and accurate decisions on the development of drug candidates or combinations.
[More](#)
[+ JOIN](#)

ADVANCE
total 2
Accelerated development of vaccine benefit-risk collaboration in Europe

DEMO
total 3
This community is only used for Catalogue experiences

Related publications

- 2016/Jun
[Tolerability and pharmacokinetics of oxaloacetate 100 mg capsules in Alzheimer's subjects.](#) has been published on BBA clinical 5 (120-3) [EMIF AD](#)
- 2016/Mar
[The association between PGC-1α and Alzheimer's disease.](#) has been published on Anatomy & cell biology 49 (1-6) [EMIF AD](#)
- 2015 Oct-Dec
[A New Look at Glaucoma.](#) has been published on Journal of ophthalmic & vision research 10 (502-3) [EMIF AD](#)
- 2016/Apr/5
[Evidence that electronic health records can promote physician counseling for healthy behaviors.](#) has been published

Catalogue – AD cohorts



EMIF Catalogue - Google Chrome
<https://emif-catalogue.eu/c/adcohort>

EMIF CATALOGUE / EMIF AD

Free text search EMIF AD

EMIF AD / All

Compare Print
 Selected databases: 0

Acronym	Name	Institution name	Location	S...	P...	Last update	Select
Filter	Filter	Filter	Filter	Fil	Filt	Filter	?
AddNeuroMed	AddNeuroMed, Innovative Medicines for Europe (Innomed)	Institute of Psychiatry, King's College London	City of London, Greater London, England, United Kingdom			2016-04-04	☐
ADGEN	Kuopio-ADGEN	University of Eastern Finland	Kuopio, Kuopio, Pohjois-Savo, Finland			2015-11-06	☐
ADNI-1	Alzheimer's Disease Neuroimaging Initiative	University of California	San Francisco County, California, United States			2015-11-06	☐
ADNI 2	Alzheimer's Disease Neuroimaging Initiative	University of California	San Francisco County, California, United States			2015-11-06	☐
ADNI-GO	Alzheimer's Disease Neuroimaging Initiative	University of California	San Diego County, California, United States			2015-11-05	☐

Cohort information



Fingerprint

Literature

Documents

Discussion

Extra Information

Hits: 434 Unique Views: 239 Filled: 78.8 %

6.01. Number of subjects with at least one assessment



6.01.01. Number of subjects

☒ Normal

266

☐ Subjective complaints

☒ MCI

247

☒ Probable/possible AD (NINCDS-ADRDA)

258

☐ AD- preclinical stage (IWG/NIA)

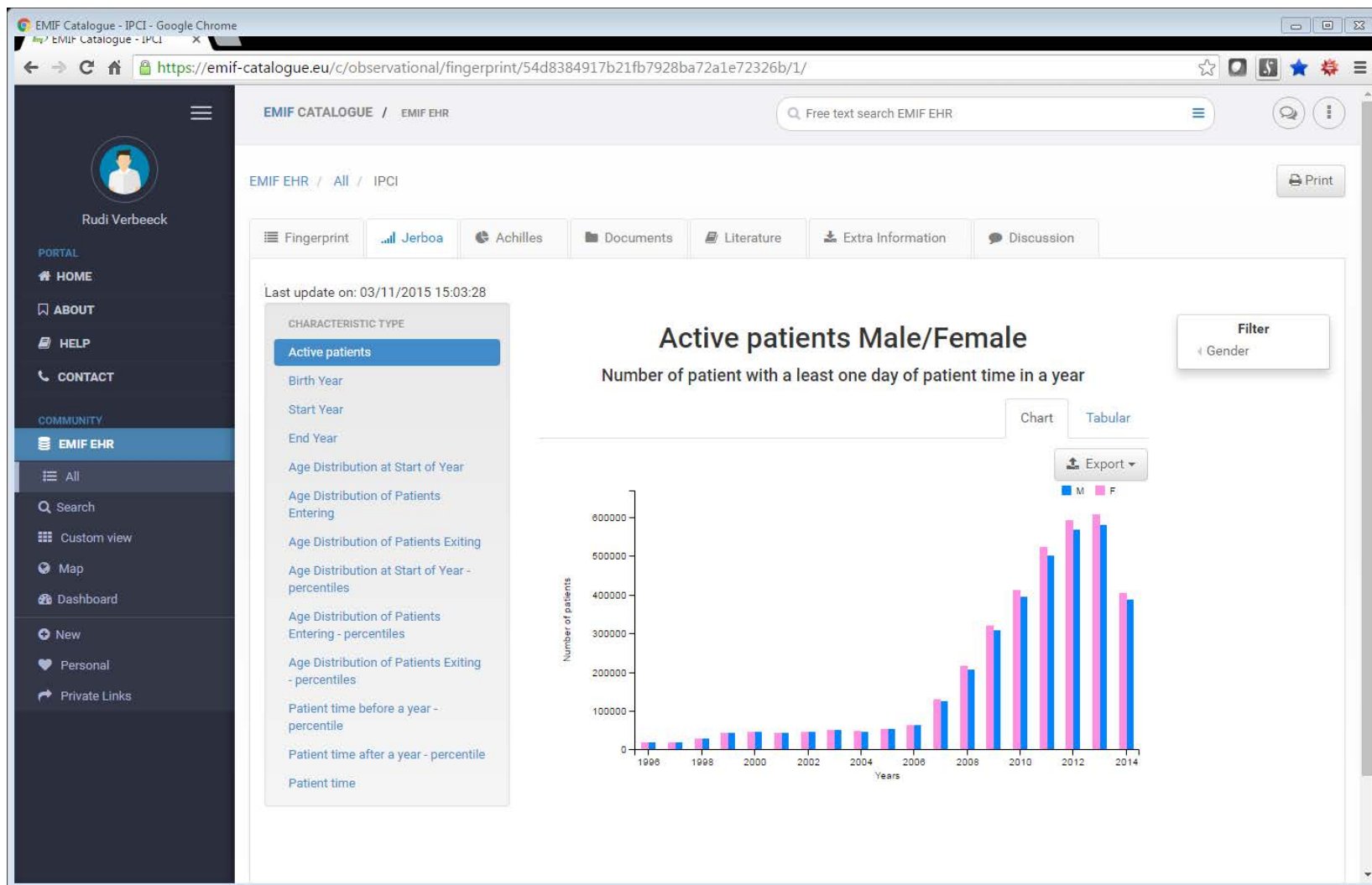
< Previous

Next >

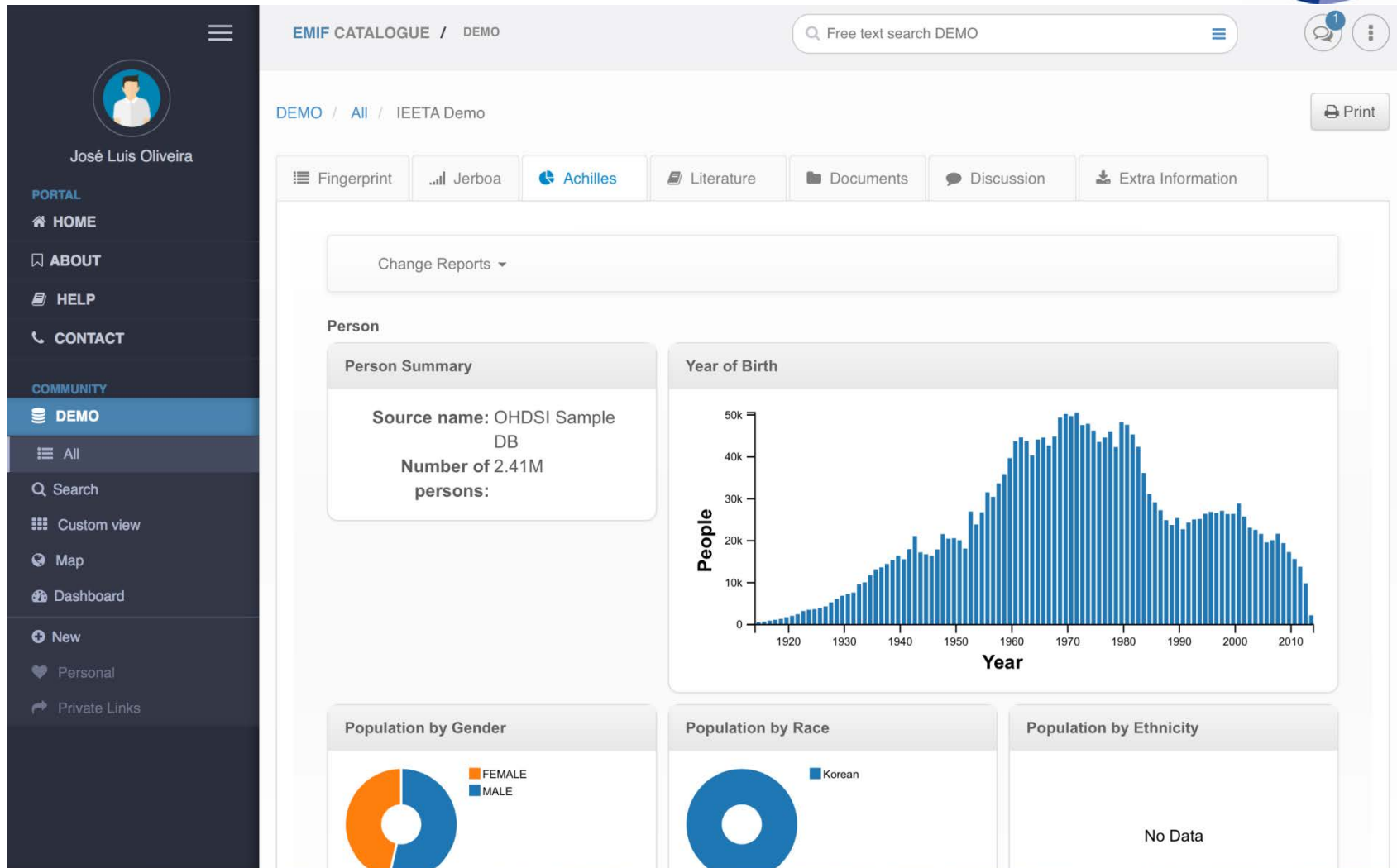
Summary Collapse Filters

1. Database General In... 60%
2. Key Publications (1/1) 100%
3. Data Access (47/48) 97%
4. Study Characteristic... 94%
5. Inclusion / Exclusion ... 66%
6. Number of subjects (... 42%
7. Clinical Information (... 100%
8. Dementia rating scal... 76%
9. Subjective Cognitive ... 100%
10. Neuropsychiatric S... 91%
11. Quality of Life (10/11) 90%
12. Caregiver (1/1) 100%
13. Health Resource Ut... 100%
14. Other scales (2/2) 100%

Catalogue – suitability



Integration in the EMIF-Platform



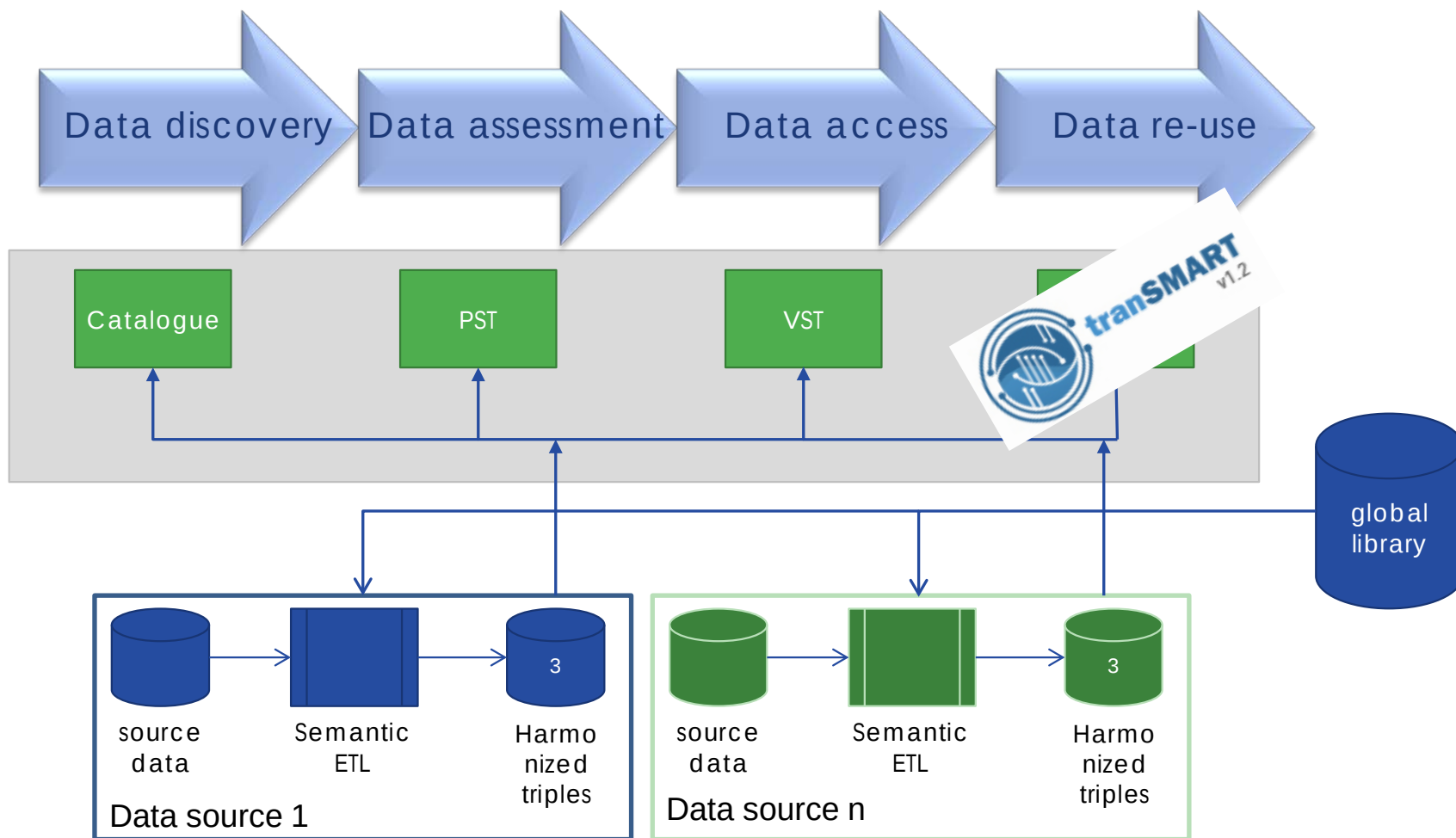
Content EMIF-AD Catalogue



	Number of cohorts
Clinical	31
Population	7
Trial	1
Other	5

	Number of subjects
Normal cognition	31376
Subjective cognitive complaints	4369
Mild cognitive impairment	11287
Alzheimer's disease dementia	9754
Other dementia	2453
	Total N= 59239

Cohorts: From data discovery to re-use



Participant selection tool



Participant Selection Tool

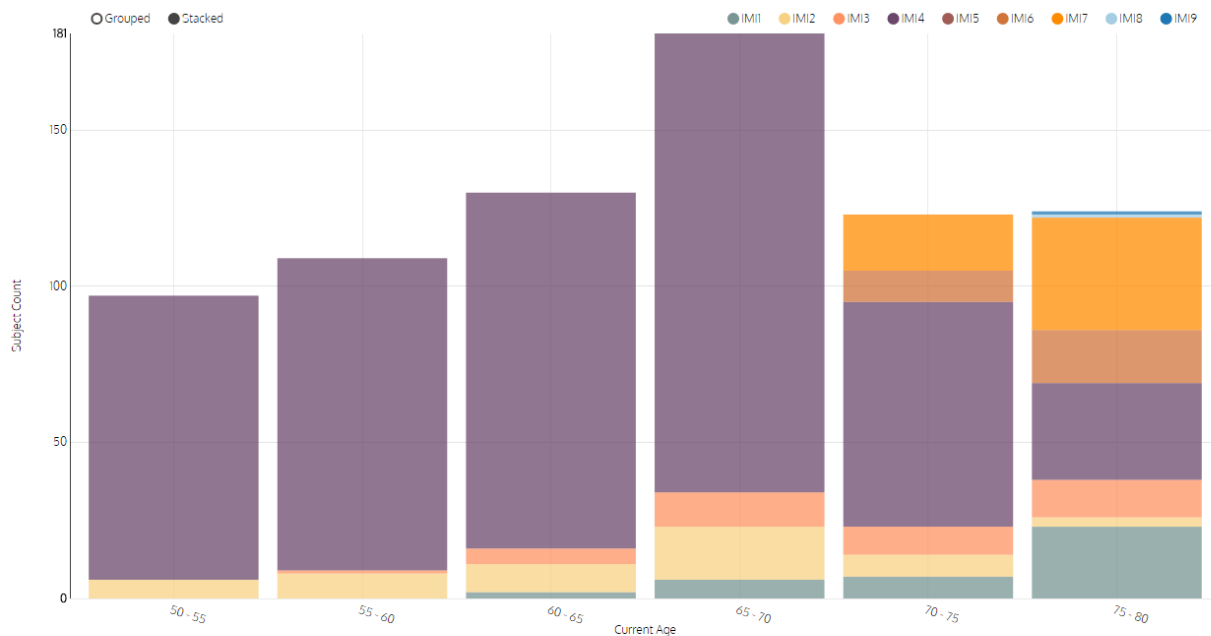
Welcome michel

Total Subjects: 649

All Subjects Summary Graph Summary Graph with attribute selection Attribute Breakdown

Summary Graph with attribute selection

Group by: Current Age



Current Age between 50 and 80 APOE Genotype e2_e4, e3_e4, e4_e4

Subject Selection

Summary view

Current Age

50



80

APOE Genotype

e2_e2 [25]

e2_e3 [116]

☒ e2_e4 [44]

e3_e3 [2532]

☒ e3_e4 [1023]

☒ e4_e4 [114]



Save

Load

Export

Variable selection tool



Variable Selection Tool

Welcome michel

Total Subjects: 7580

Participant Selection Tool

Variable Selection Tool

Request Form

Status Tracker

name	IMI1	IMI2	IMI3	IMI4	IMI5	IMI6	IMI7	IMI8	IMI9
APOE Genotype	244	119	161	2641	0	234	509	84	49
RAVLT	250	0	0	0	0	0	0	0	0
MMSE	250	119	163	0	3507	0	0	0	0
CERAD Word List Delayed Recall	0	0	0	0	3530	0	0	0	0
Amyloid Beta 42 in CSF	0	119	0	0	0	0	0	0	0
Logical Memory Delayed - Norm	0	0	0	2641	0	0	0	0	0
Logical Memory Immediate - Norm	0	0	0	2641	0	0	0	0	0
Gender	250	0	164	2641	3530	234	509	84	49

SELECTED:

MMSE



Gender



Amyloid Beta 42 in CSF



Only show selected variables

tranSMART Homepage



Navigation bar: All [dropdown] [dropdown] Analyze Gene Signature/Lists Utilities

Comparison Summary Statistics Grid View Advanced Workflow Data Export Export Jobs Analysis Jobs Workspace Genome Browser

Active Filters and [icon] Filter Clear

Navigate Terms

- Across Trials
- Private Studies
 - AddNeuroMed (786)
 - Antwerp (150)
 - Clinical Information (150)
 - Cognitive Screening Tests (150)
 - Mini Mental State Exam (150)
 - Demographics (149)
 - Imaging (58)
 - Laboratory Test Results (150)
 - Blood (150)
 - CSF (150)
 - Neuropsychological Examination (150)
 - Attention and Executive Function (14)
 - Dates Neuropsychological Examination (14)
 - Language (145)
 - Memory (145)
 - Visuoconstruction (143)
 - Rating Scales (150)
 - Study Information (150)
 - Subject Characteristics (73)
- Descripta (881)
- EDAR (332)
 - Clinical Information (332)
 - Alcohol (305)
 - Comorbidities (330)
 - Dates Follow-up Visits (162)
 - Diagnosis (323)
 - Family History of Dementia (253)
 - Medication Use (288)
 - Smoking (313)
 - Smoking Amount (31)

Subset 1

Exclude X

AND Exclude X

AND Exclude X

Subset 2

Exclude X

AND Exclude X

AND Exclude X

Save Subset X Clear

Using tranSMART



❖ 1000 study (WP3)

Navigation bar: Browse Analyze Sample Explorer Gene Signature/Lists GWAS Upload Data Utilities

Comparison Summary Statistics Grid View Advanced Workflow Data Export Export Jobs Analysis Jobs Workspace Sample Details

Active Filters: and or Filter Clear

622 0 0

1000 Study V02 (662)

- Clinical Information (662)
 - Alcohol Use (327)
 - Clinical Visits Dates (586)
 - Comorbidity (514)
 - Diagnoses (655)
 - Family History of Dementia (242)
 - Medication Use (375)
 - Smoking Habits (331)
 - Vital Signs (213)
- Cognitive Screening Tests (661)
 - Memory Alteration Test (116)
 - Mini Mental State Exam (659)
- Demographics (661)
 - Baseline (657)
 - Sex (661)
 - Female (366)
 - Male (295)
- Imaging (482)
- Laboratory Test Results (662)
 - Blood (387)
 - CSF (662)
- Neuropsychological Examination (661)
- Pharmacogenetics Findings (482)
- Rating Scales (639)
 - Dates Rating Scales (196)
 - Dementia Rating Scales (630)
 - Neuropsychiatric Scales (443)

Histogram of Age

Count

Subset 1

Comparison of Age

Value

Subset 1

Subset 1

- Mean: 69.16
- Median: 70
- IQR: 13
- SD: 10.6
- Data Points: 622

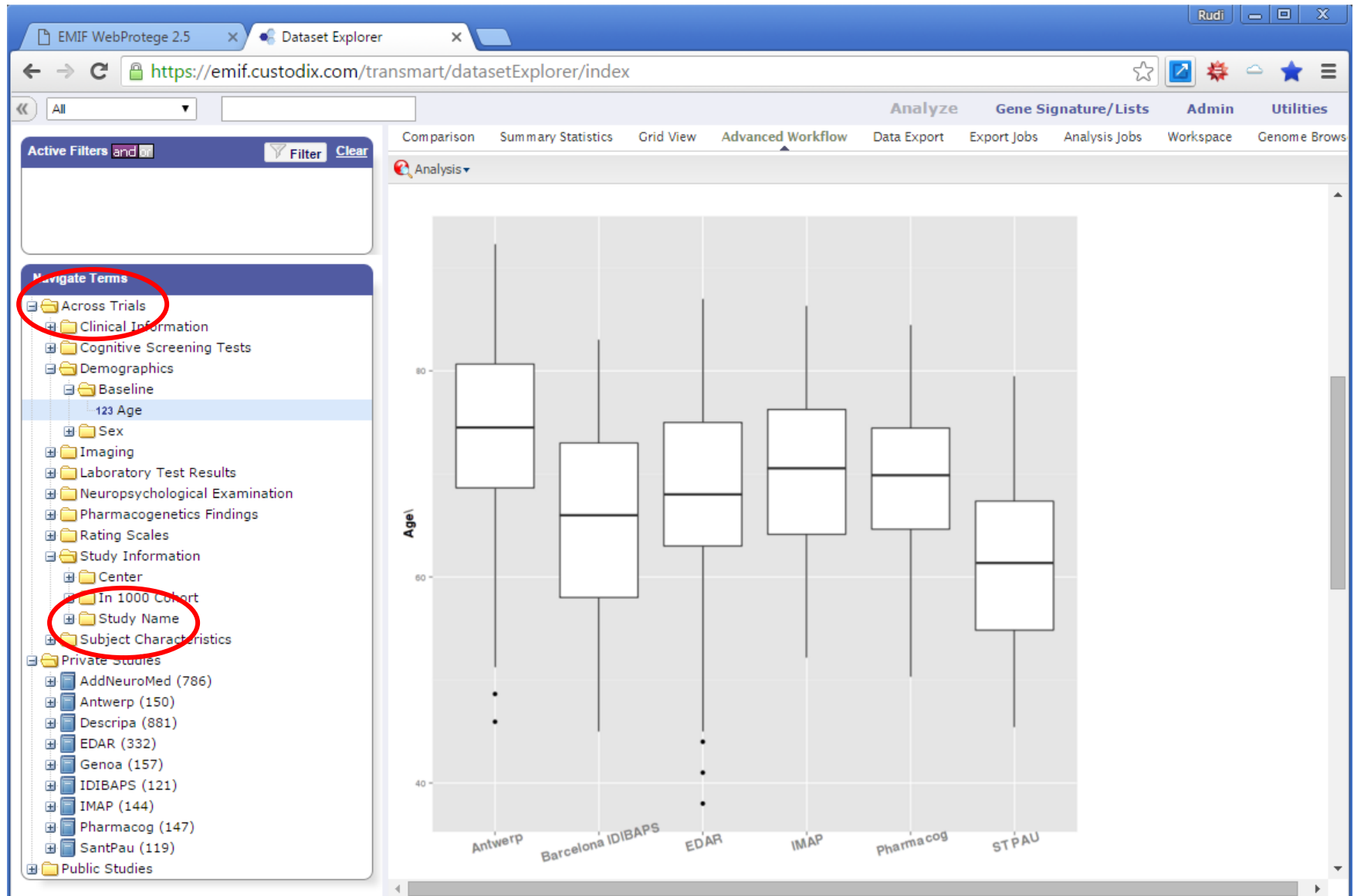
Sex

MAL E

FEM ALE

Category	Subset 1 (n)	Subset 1 (%n)
1	1	0.2%
FEMALE	366	58.8%

tranSMART cross-trial analysis



AD cohorts in tranSMART



Cohorts	N
AddNeuroMed	786
Antwerp	150
Descripa	881
EDAR	332
Genoa	157
IDIBAPS	167
IMAP	144
Lausanne	40
Pharmacog	147
St Pau	119
	Total N= 2923