



First EUBIROD Diabetes Report

Design and Statistical Analysis

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Serectrix snc

EUBIROD Final Meeting
Brussels, 26-27th August 2011

Data sources



- University of Perugia (I)
- University of Dundee (UK)
- Joanneum Research (AT)
- NOKLUS (NO)
- Paulescu Institute (RO)
- University of Malta (MT)
- Republic of Cyprus (CY)
- Sahlgrenska Institute (SE)
- University of Debrecen (HU)
- Institute of Public Health (BE)
- Adelaide Meath Hospital (IR)
- CBO (NL)
- Centre Hospitalier (LU)
- University of Ljubljana (SI)
- Medical University Silesia (PL)
- Vuk Vrhovak University (HR)

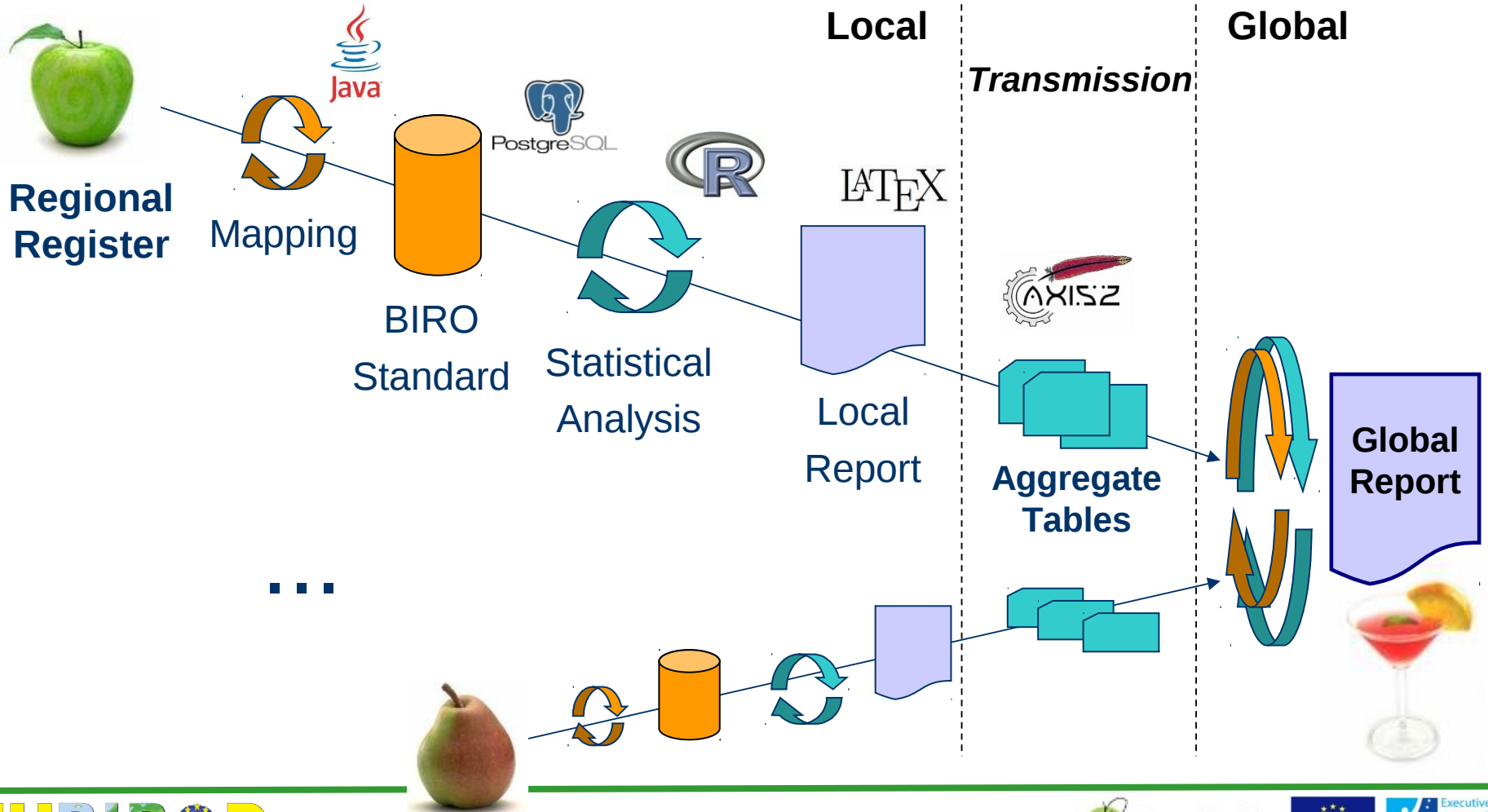


Data collection 2011



- 01/7/2011 Launch of data collection (Agenda)
- 15/7/2011 BIRO Release 2.0.9
- 16/7/2011 First Local Report (S.Pruna, Romania)
- 19/7/2011 BIRO UIDs Distributed
- 21/7/2011 BIRO Beta Test Group (Italy, Scotland, Netherlands, Croatia, Romania, Ireland)
- 11/8/2011 BIRO Release 2.1.0
- 20/8/2011 Last Local Report (F.Storms, Netherlands)
- 21/8/2011 Upload of the EU Report

The BIRO System



Data Definitions



EUBIROD COMMON DATASET
WORKPACKAGE 5 (University of Dundee)
Deliverable 5.1 (September 2010)

http://www.eubirod.eu/documents/downloads/D5_1_Common_Dataset.pdf

BIRO XML UPDATE
WORKPACKAGE 4 (University of Dundee)
Deliverable 4.3 (July 2009)

http://www.biro-project.eu/documents/downloads/D4_3_Dictionary_XML_Update_v1_0.pdf

CLINICAL REVIEW UPDATE
WORKPACKAGE 2 (Joanneum)
Deliverable 2.2 (January 2009)

http://www.biro-project.eu/documents/downloads/D2_2_Clinical_Review_Update.pdf

Data Entry System the BIROBox



Applications Places System

Deu Thu Jan 20, 22:11 biro

sample_anon.csv

workingDirectoryExample

BIRO box

Link to The EUBIROD Project

Pentaho Data Integration

VBOXADDITIONS_3.2.10_66523

BIROBox

Help

B.I.R.
Best Information through Regional Outcomes

BIROBox
Setup

BIRO Database
Database Engine

Local Report
Statistical Engine

Data Import Configuration Manager

Data import configuration list:

- foligno
- spoletto
- orvieto
- gubbio
- perugia
- terni
- umbria
- ireland

New
Delete
Copy

BIROBox Startup

B.I.R.
Best Information through Regional Outcomes

Welcome to the BIROBox

Please select the working directory

/home/birox/workingDirectory/

Browse

OK CANCEL

Inspect Import Export


Data Source Profile



Applications Places System Ita Thu Aug 25, 23:38 biro

BIROBox

Help



BIROBox

Setup

BIRO Database

Database Engine

Local Report

Statistical Engine

Global Report

Central Engine

Data Transmission

Communication Software

Data source configuration
Configure static BIRO fields

Data Source Name *

Data Source ID *

Data Source Type *

Site header fields

Field	Value
Clinical Contact*	Massimo Massi Benedetti
Clinical Contact Email Address*	massi@unipg.it
Country of Origin*	Italy
Mailing Address*	University of Perugia
Mailing Address*	Via Enrico dal Pozzo
Mailing Address	Perugia
Mailing Address	Italy
Post Code	06126
Technical Contact*	Luca Rossi
Technical Contact Email Address*	redsluke@gmail.com
Web Site Address	www.unipg.it

Site profile fields *

Field	Value
Data Source Denominator*	900790
Diabetologists*	25
Doctors*	40
Geographical Area*	8456
Hospital Beds*	3278
Physicians*	100
Physicians Offering DMP*	0
Specialist Diabetes Nurses*	50


*= required fields

Mapping



BIROBox

Help



BIROBox

Setup

BIRO Database

Database Engine

Local Report

Statistical Engine

Data Transmission

Communication Software

Global Report

Central Engine

Global Connection

Web Portal

Fields mapping configuration

Configure mapping between BIRO fields and local fields

BIRO field

- Date of Birth
- Date of Diagnosis
- Patient ID
- Sex
- Sub-Data Source ID
- Type of Diabetes
- Alcohol Intake
- Alcohol status
- Amputation
- Anti Platelet Therapy
- Average Injections
- Blindness
- BMI
- Cigarettes per day
- Creatinine
- Diabetes Specific Education
- Diastolic blood-pressure
- End Stage Renal Failure
- Episode Date
- Eye Examination
- Foot Examination
- Foot Pulses
- Foot Sensation
- Foot Ulcer
- HbA1c
- HDL
- Height
- Hypertension
- Hypertensive Medication
- Hypoglycaemic Drug Therapy
- Laser
- LDL
- Lipid Therapy
- Maculopathy
- Microalbumin
- Myocardial Infarction
- Nasal Therapy
- Oral Therapy

BIRO field name: TYPE_DM

BIRO field description:
Type of Diabetes

Extract from local database

Local field name:
tipoDiabeteInt

BIRO category	Expression	Local value	BIRO Value
Type 1	# is custom text	1	1
Type 2	# is custom text	2	2
Other Types	# is custom text	0	3

Previous
Finish

Data Quality Check Inclusion Criteria



DATABASE ENGINE

EUBIROD WORKPACKAGE 5 (University of Perugia)

DELIVERABLE 5.3 (September 2010)

http://www.eubirod.eu/documents/downloads/D5_3_Database_Engine.pdf

1. DATA QUALITY CHECK

DATA FORMAT

- Missing Values
- Wrong Format (not parsable)
- Out of Range

COHERENCE

- Date of Birth > Date of Diagnosis, Date of Birth > Episode Date
- Date of Diagnosis > Episode Date

DUPLICATES

2. DATA CLEANING

Records with null values for the key fields (patient id, episode date) and in general for all mandatory fields (patient id, episode date, sex, date of diagnosis, date of birth, type of diabetes)

ARE DISCARDED


Database Import



Applications Places System Ita Thu Aug 25, 23:55 birox

BIROBox

Help



BIROBox

Setup

BIRO Database

Database Engine

Local Report

Statistical Engine

Global Report

Central Engine

Data Transmission

Communication Software

Inspector

Data Sources

Merge table

Activity table

Population table

Diabetic population table

Data Quality Check- Log File

[/home/birox/shared/wd/_de_dataimport/log/umbria.log](#) show

BIRO OUTPUT Database

URL: jdbc:postgresql://localhost/umbria

biro_marker

episode_count

episode_duplicate

episode_wide

episode_wide_20081231

episode_wide_20091231

field_export_profiles

merge_quality

merge_table

metadata

population_quality

population_table

profile_count

profile_duplicate

profile_wide

profile_wide_20081231

profile_wide_20091231

site_header

site_profile

Previous

episode wide

ds id	record id	patient id	sub ds id	biquanides	creat
ITE2.1	1	1_2	1	0	
ITE2.1	3	1_61	1	0	
ITE2.1	4	1_94	1	1	
ITE2.1	5	1_98	1	1	
ITE2.1	6	1_131	1	1	
ITE2.1	8	1_168	1	0	114.94
ITE2.1	9	1_208	1	1	
ITE2.1	10	1_220	1	1	
ITE2.1	12	1_248	1	1	
ITE2.1	13	1_344	1	1	
ITE2.1	14	1_344	1	1	
ITE2.1	15	1_358	1	1	
ITE2.1	16	1_409	1	1	
ITE2.1	17	1_422	1	1	
ITE2.1	19	1_502	1	1	
ITE2.1	20	1_524	1	1	
ITE2.1	21	1_524	1	1	
ITE2.1	23	1_562	1	0	
ITE2.1	24	1_625	1	1	
ITE2.1	25	1_739	1	0	
ITE2.1	26	1_753	1	0	
ITE2.1	27	1_774	1	0	
ITE2.1	28	1_823	1	0	

/home/birox/shared/birobox_testdata/umbria.csv

```

1|6859|1_6859|1937/07/19|M|1985/01/01|2|2003/12/10|||||8.2|160.0|74.5|
1|6858|1_6858|1920/10/27|M|1975/01/01|2|2002/09/09|||||225.0|37.0|
1|6858|1_6858|1920/10/27|M|1975/01/01|2|2003/01/09|||||8.4|179.0|10|0|
1|6859|1_6859|1937/07/19|M|1985/01/01|2|2003/12/10|||||8.2|160.0|74.5|
1|6859|1_6859|1937/07/19|M|1985/01/01|2|2007/07/25|||||8.3|111|10|0|
1|6859|1_6859|1937/07/19|M|1985/01/01|2|2007/12/05|||||7.7|111|10|0|
1|6859|1_6859|1937/07/19|M|1985/01/01|2|2008/03/12|165.0|30.9|118.5|
1|6859|1_6859|1937/07/19|M|1985/01/01|2|2008/07/16|165.0|117.6|111|0|
1|6859|1_6859|1937/07/19|M|1985/01/01|2|2009/02/25|165.0|118.9|111|0|
1|6860|1_6860|1941/11/06|F|1996/01/01|2|2006/10/16|||||6.9|164.0|11|0|
1|6860|1_6860|1941/11/06|F|1996/01/01|2|2007/02/28|||||177.0|55.0|102.0|
1|6860|1_6860|1941/11/06|F|1996/01/01|2|2007/12/03|||||17.1|111|10|0|

```

Target Indicators



EUBIROD Report Template
WORKPACKAGE 7
Deliverable 7.2 (May 2009)

http://www.biro-project.eu/documents/downloads/D7_2_Reports_Template_Update_XML_Metadata_Reports.pdf

Statistical Methods



STATISTICAL MATERIALS
EUBIROD WORKPACKAGE 6 (Sereatrix snc)
DELIVERABLE 6.1 (September 2010)

http://www.eubirod.eu/documents/downloads/D6_1_Statistical_Materials.pdf

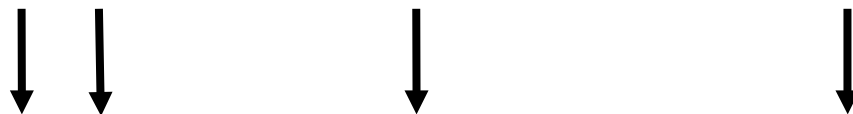
Valid Values
Contingency Tables
Chi-Square
Bars
Boxplots
Trellis Plots
Standardized Results (Tables, Bars, Forest Plot)

Standardization Method (Risk Adjusted Indicators)



Risk adjustment model (overall or within a region)

$$Y(\%) = \beta_0 + \beta_1(\text{females}) + \beta_2(\text{age_class1}) + \dots + \beta_k(\text{age_class4})$$



Source unit

$$Y_i \text{ expected} = \beta_0 + \beta_1(\text{females}) + \beta_2(\text{age_class1}) + \dots + \beta_k(\text{age_class4})$$

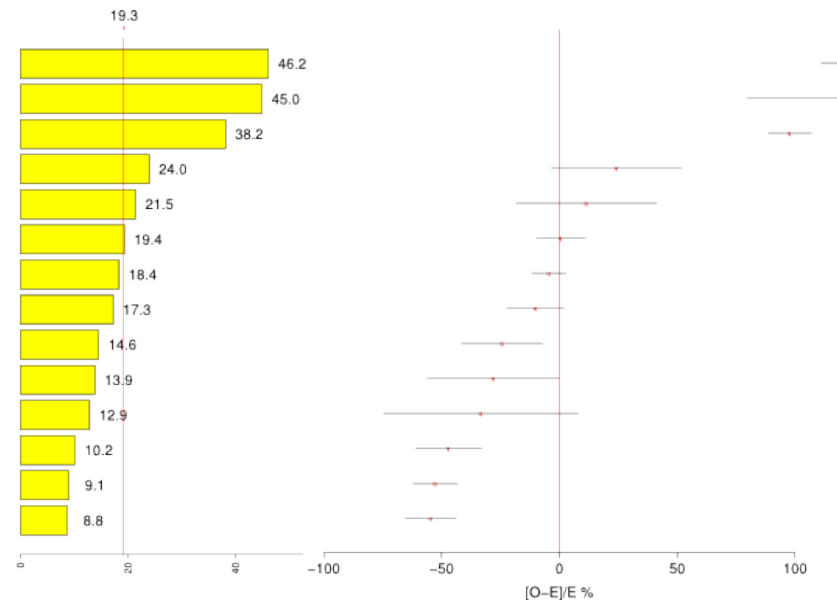
$$\sum \text{Pred}_i \times 100 = \text{Expected Rate}$$

$$\text{Standardized Rate} = (\text{observed rate} / \text{expected rate}) \times \text{population rate}$$

Standardization Method



O	E	N	CR	AR	95% C.I.	[O-E]/E %	95% C.I. [O-E]/E
79	33	159	49.7	46.2	(40.2; 52.1)	139.4	(110.8;168.0)
35	15	86	40.7	45.0	(35.6; 54.4)	133.3	(79.6;187.0)
643	325	1623	39.6	38.2	(36.3; 40.0)	97.8	(88.6;107.1)
46	37	186	24.7	24.0	(18.4; 29.5)	24.3	(-3.6; 52.2)
39	35	185	21.1	21.5	(15.8; 27.1)	11.4	(-18.5; 41.4)
313	311	1710	18.3	19.4	(17.5; 21.3)	0.6	(-9.9; 11.2)
603	631	3387	17.8	18.4	(17.1; 19.8)	-4.4	(-11.7; 2.8)
169	188	954	17.7	17.3	(14.9; 19.8)	-10.1	(-22.5; 2.3)
84	111	597	14.1	14.6	(11.4; 17.8)	-24.3	(-41.6; -7.0)
59	82	602	9.8	13.9	(10.1; 17.7)	-28.0	(-56.1; 0.0)
6	9	36	16.7	12.9	(2.5; 23.2)	-33.3	(-74.7; 8.1)
53	100	432	12.3	10.2	(7.0; 13.5)	-47.0	(-61.1;-32.9)
151	319	1632	9.3	9.1	(7.2; 11.0)	-52.7	(-62.3;-43.1)
64	141	566	11.3	8.8	(6.0; 11.5)	-54.6	(-65.6;-43.7)
2344		12155	19.3				



Standardization Method Evaluation (1)



J.Lachin

...they consider a region with a set of K hospitals. Their approach is a **hybrid of direct and indirect adjustment**. They fit a logistic model as a function of covariates (say age and sex) in the pooled group of K hospitals, as in indirect adjustment. Then they use a direct approach to estimate the expected number of events in the i th hospital.

..I thought the AHRQ derivation should have accounted for the correlation of the O_i and E_i since when numbers of events rather than rates are used, $(O-E) = V(O) + V(E)$, the covariance being zero because the two terms are based on different samples.

But on further thought, their **approach looks to be approximately OK**. Their O_i and E_i are both rates so that their $E_i \rightarrow$ a constant in probability as $n_i \rightarrow$ infinity. In that case you can invoke Slutsky's theorem and treat the E_i as a constant, as they did in steps 2 and 4.

J.Gastwirth

It **probably is an OK approximation** but I'd be concerned that all the P_{ij} 's are based on fitting the logistic to all the data. A possible check is a variant of Peters-Belson, which I did with Sam (Stat Med 1995, approx). One could delete hospital i , say, from the data used to create the logistic model. Then O_i and E_i would be independent.

Standardization Method Evaluation (2)

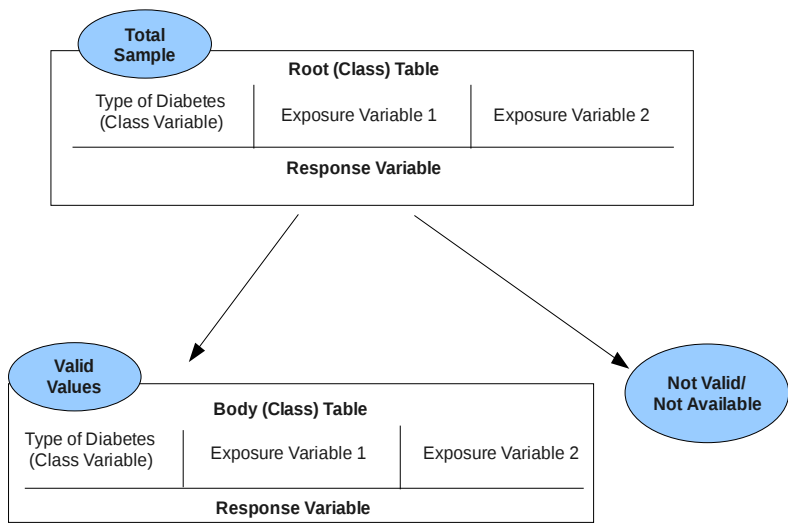


J.Lachin

It would be nice to work out a more exact solution, but what you're doing is OK.

If the model is fit to a large sample, say 100,000 subjects, and then applied to a single hospital (included in the 100,000) with say 1000 subjects, then the correlation will be minimal and everything will be fine. A problem might arise when there are only 3 hospitals used to fit the data with say n of 3,000 total.

Reading the results



Body (Class) Graphs

BARPLOTS
Exposure Variable 1 (Exposure Variable 2)
Data Source

Response Variable=Categorical

TRELLIS / BOXPLOTS
Exposure Variable 1 (Exposure Variable 2)
(Data Source)

Response Variable=Continuous

Standardized (Class) Estimates (Risk Adjusted Estimators) Data Source Response Variable
--

Standardized (Class) Graphs

BARPLOTS
FOREST PLOTS
Data Source
Response Variable

Sending the results



Applications Places System Ita Thu Aug 25, 23:32 birox

BIROBox

Help

B.I.R.
Best Information through Regional Outcomes

BIROBox Setup

BIRO Database Database Engine

Local Report Statistical Engine

Global Report Central Engine

Data Transmission Communication Software

Communicator Configuration
Central BIRO System IP address: 194.243.52.190

Please choose a statistical object to be sent:

Id	Year	Creation date	Last sending date
run-20110811132833	2009	2011-08-11 13:28:33	2011-08-11 17:11:57.425

Send the following statistical object: run-20110811132833

Send


Building the global report: using the Central Engine



Applications Places System Ita ↑ Thu Aug 25, 23:35 birox

BIROBox

Help



BIROBox

Setup

BIRO Database

Database Engine

Local Report

Statistical Engine

Global Report

Central Engine

Data Transmission

Communication Software

Central Engine Configuration

Source Directory Browse

Analysis description

Please choose a statistical object to be imported

Id	Year	Creation date
run-20110817120000	2009	2011-08-17 12:00:00

Add Refresh

Contents of the statistical object

BIRO Centre Code	Description	Date start	Date end
CY.1	[European Union].[Cyprus]	2009-01-01	2009-12-31

Processing queue

Year	Centre ID	Start date	End date	Creation date
2009	AT22.1	2009-01-01	2009-12-31	2011-08-18 14:38:32
2009	BE.1	2009-01-01	2009-12-31	2011-08-12 09:34:05
2009	CY.1	2009-01-01	2009-12-31	2011-08-17 12:00:00

Delete

Run Central Engine Browse Results

Outputs



Execution Times:

Local : 13 minutes – 1 hour 13 minutes

Global: 3 Hours 6 Minutes 15 Seconds (N=16 partners)

GLOBAL REPORT

N Indicators = 76

N Subjects = 118,156

PDF No. Pages: 1,708

Html/Tables/Graphs

Statistical Objects (Recursive application)

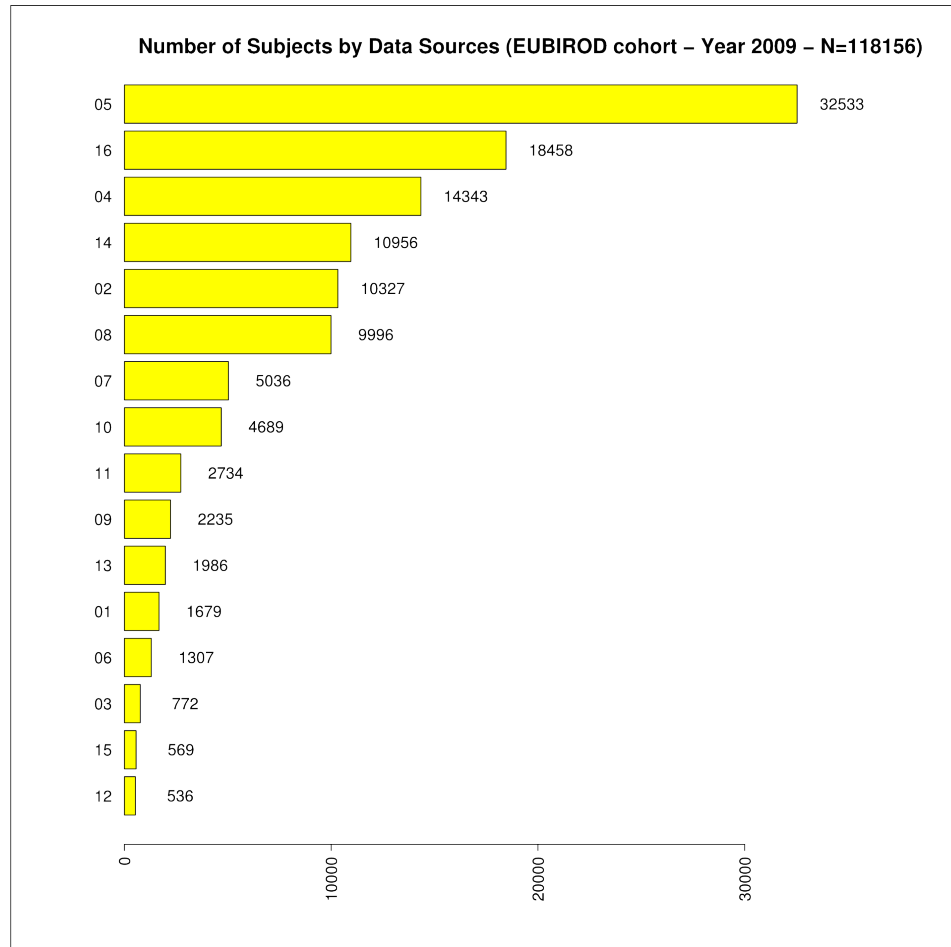
EUBIROD Cohort

BIRO UID + Label - N=16



NO.1 [European Union].[Norway]
SE232.1 [European Union].[Sweden].[Sodra Sverige].[Vastsverige].[Vastra Gotalands lan]
UKM21.1 [European Union].[United Kingdom].[SCOTLAND].[Eastern Scotland].[Angus and Dundee City]
IE021.1 [European Union].[Ireland].[IRELAND].[Southern and Eastern].[Dublin]
PL22A.1 [European Union].[Poland].[REGION POLUDNIOWY].[Slaskie].[Katowicki]
NL321.1 [European Union].[Netherlands].[WEST-NEDERLAND].[Noord-Holland].[Kop van Noord-Holland]
BE.1 [European Union].[Belgium]
DEB.1 [European Union].[Germany].[RHEINLAND-PFALZ]
HU.1 [European Union].[Hungary]
AT22.1 [European Union].[Austria].[SUDOSTERREICH].[Steiermark]
SI.1 [European Union].[Slovenia]
HR.1 [European Union].[Croatia]
RO321.1 [European Union].[Romania].[Macroregiunea trei].[Bucuresti-Ilfov].[Bucuresti]
ITE2.1 [European Union].[Italy].[CENTRO(I)].[Umbria]
CY.1 [European Union].[Cyprus]
MT.1 [European Union].[Malta]

EUBIROD Cohort General Population



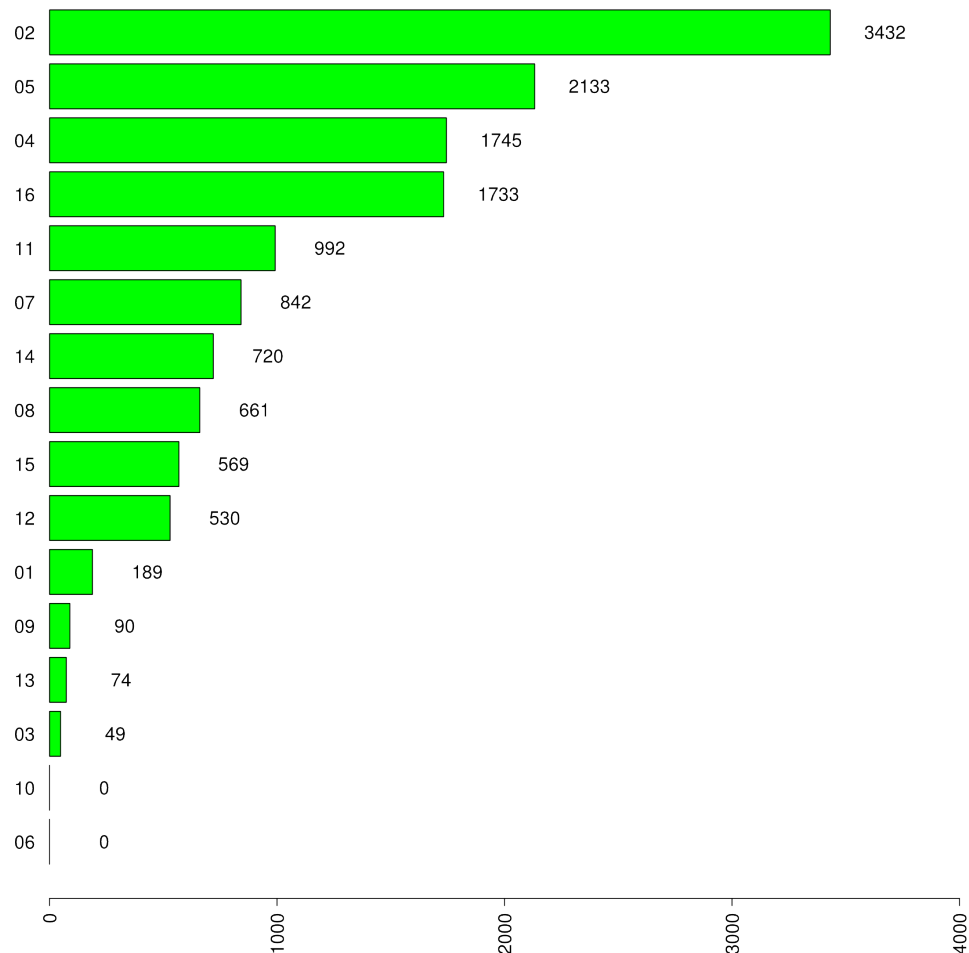
All data relate to year 2009, except for Belgium (2007), Hungary, Sweden (2008)

EUBIROD Cohort

Diabetes Type 1



Number of Subjects by Data Sources (EUBIROD cohort – Year 2009 – N=13759)

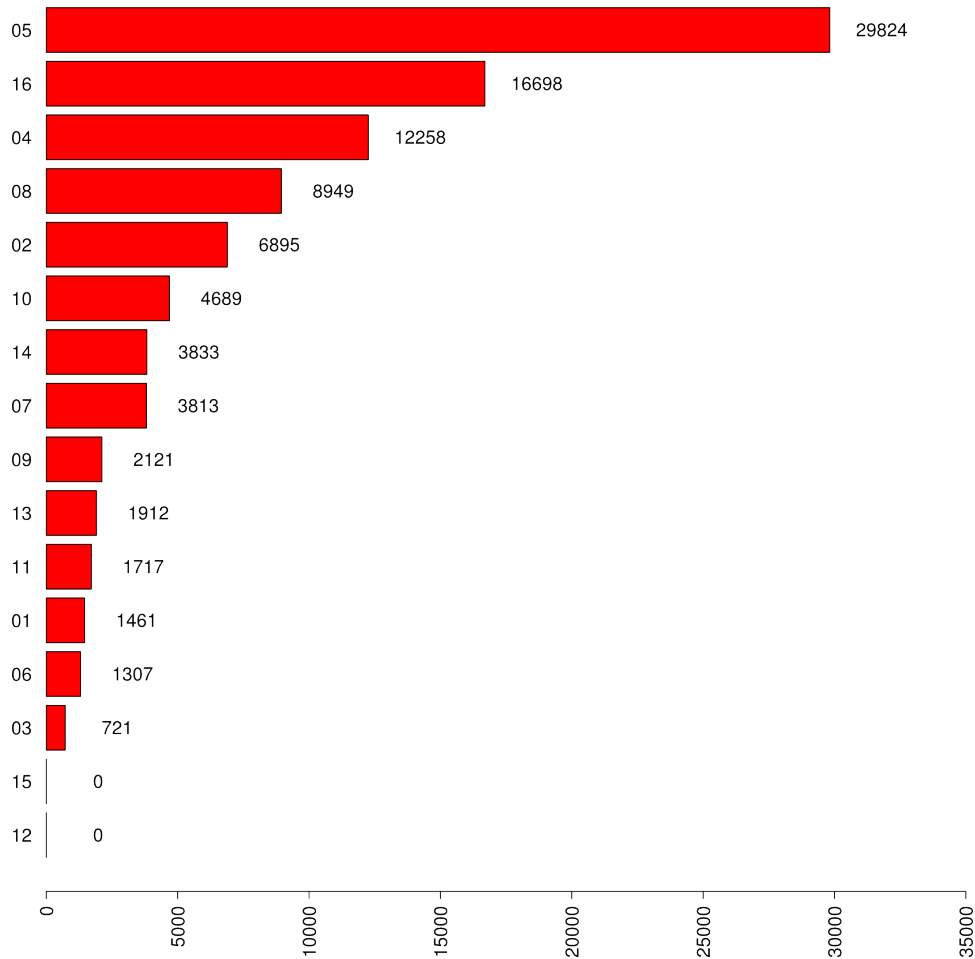


EUBIROD Cohort

Diabetes Type 2



Number of Subjects by Data Sources (EUBIROD cohort – Year 2009 – N=96198)

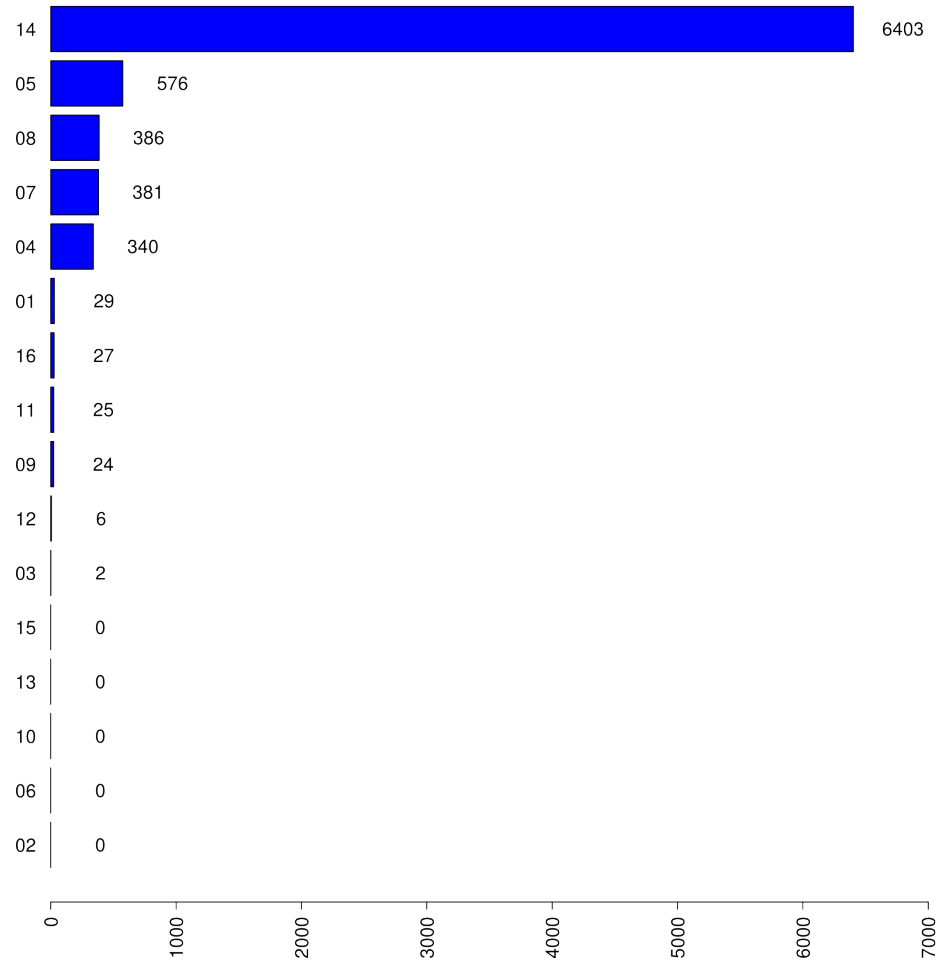


EUBIROD Cohort

Other Type of Diabetes



Number of Subjects by Data Sources (EUBIROD cohort – Year 2009 – N=8199)



Data Sources Contribution to BIRO Indicators (1)



1. Demographics

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Age, Gender	1.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

2.1 Clinical characteristics

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Type of Diabetes	2.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Diabetes Duration	2.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Data Sources Contribution to BIRO Indicators (2)



2.2 Risk Factors for Diabetes Complications

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
2.2.1 Obesity																	
Weight	2.2.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
BMI	2.2.1.2					X		X			X						
2.2.2 Lifestyle																	
Smoking Status	2.2.2.1	X	X	X	X	X	X	X		X	X	X	X	X	X		X
2.2.3 Clinical Measurements																	
SBP	2.2.3.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
DBP	2.2.3.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Tot Cholesterol	2.2.3.3	X	X	X	X	X	X	X	X	X	X	X	X		X		X
HDL	2.2.3.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Creatinine	2.2.3.5	X	X	X	X	X	X	X	X	X	X	X		X	X		X
HbA1c	2.2.3.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Data Sources Contribution to BIRO Indicators (3)



2.3 Diabetes Complications

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Retinopathy	2.3.1	X		X	X	X	X	X		X		X	X				X
ESRF	2.3.2	X	X	X	X	X		X		X	X		X				X
Foot Ulcer	2.3.3	X	X	X	X	X	X	X		X			X		X		X
L.E. Amputation	2.3.4	X	X	X	X	X	X	X		X		X	X		X		X
Stroke	2.3.5	X	X	X	X	X	X			X		X	X		X		X
AMI	2.3.6	X	X	X	X	X	X			X					X		X
Hypertension	2.3.7	X		X	X	X	X			X		X	X	X	X		X

Data Sources Contribution to BIRO Indicators (4)



3. Health System (1)

3.1. Structure (provider level)

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Type of Provider	3.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Av. Diab.Pop.Centre	3.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

3.2 Structural Quality

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
H.Beds x 100,000	3.2.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Physicians x 100,000	3.2.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Data Sources Contribution to BIRO Indicators (5)



3. Health System (2)

3.3. Processes

3.3.1-3 Examinations, Measurements

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Foot	3.3.1.1	X	X	X	X	X	X	X				X	X		X		X
Eye	3.3.2.1	X	X	X	X	X	X	X		X		X	X		X		X
Blood Pressure	3.3.3.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Lipids	3.3.3.2	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Microalbumin	3.3.3.3	X	X	X	X	X		X		X	X	X	X				X
HbA1c	3.3.3.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

3.3.4 Treatment

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Antihypertensive	3.3.4.1	X	X	X	X	X	X			X		X	X		X		X
Lipid Lowering	3.3.4.2	X	X	X	X	X	X					X	X		X		
Aspirin	3.3.4.3	X	X	X	X		X					X	X				
Diet Only	3.3.4.4.1	X		X	X	X		X	X	X							X
Tablets	3.3.4.4.2	X		X	X	X		X	X	X							X
Insulin Only	3.3.4.4.3	X	X	X	X	X		X	X	X			X			X	X
Insulin and Tablets	3.3.4.4.4	X	X	X	X	X		X	X	X			X				X
Insulin Pump	3.3.4.4.5	X	X	X	X	X		X				X				X	

3.3.5 Management

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Self-Monitoring	3.3.5.1	X	X	X	X	X				X			X				X
Visit Frequency	3.3.5.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Data Sources Contribution to BIRO Indicators (6)



4. Population

4.1 Area Level

Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Total Population	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Life Expectancy	X	X	X	X	X	X	X	X	X	X	X		X	X		
Mortality Data	X	X	X	X	X	X	X	X	X	X	X		X	X		

Data Sources Contribution to BIRO Indicators (7)



5. Risk Adjusted Indicators (1)

5.1 Epidemiology

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Prevalence x 1,000	5.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Age at diagnosis	5.1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

5.2 Process Quality

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
% HbA Done	5.2.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
% Microalb. Done	5.2.2	X	X	X	X	X		X		X	X	X					X
% Eye Exam Done	5.2.3	X	X	X	X	X	X	X		X		X	X		X		X
% Feet Exam Done	5.2.4	X	X	X	X	X	X	X				X	X		X		X
% Smoking Ascertain.	5.2.5	X	X	X	X	X	X	X		X	X	X	X	X	X		X
% Serum Creat. Done	5.2.6	X	X	X	X	X	X	X	X	X	X	X		X	X		X
% BP Measured	5.2.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
% Hypert. + H.Medic.	5.2.8	X		X	X	X	X			X		X					
% Sulphonyureas	5.2.9.1	X		X		X	X					X			X		
% Biguanides	5.2.9.2	X		X		X	X					X			X		
% Glucos.Inhib.	5.2.9.3	X		X		X	X								X		
% Glitazones	5.2.9.4			X		X	X					X			X		
% Glinides	5.2.9.5			X		X	X								X		
% Insulin	5.2.10	X	X	X	X	X		X	X	X			X			X	X
% Insulin + OADs	5.2.11	X	X	X	X	X		X	X	X			X			X	X
% Insulin Pump	5.2.12	X	X	X	X	X		X								X	
% Antihypertensive	5.2.13	X		X	X	X	X			X		X	X		X		X
% Lipid Lowering	5.2.14	X	X	X	X	X	X					X	X		X		
% Aspirin	5.2.15	X	X	X	X		X					X	X				
% B.G. Self-monitoring	5.2.16	X	X	X	X	X				X			X				X

Data Sources Contribution to BIRO Indicators (8)



5. Risk Adjusted Indicators (2)

5.3 Intermediate Outcomes

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
% HbA1c>9	5.3.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
% Hba1c >7.5	5.3.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
% BP<140/90 mmHg	5.3.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
% BMI>30	5.3.4					X		X			X						
% Microalbuminuria	5.3.5	X	X	X	X	X		X		X	X	X	X				X
% Smoking	5.3.6	X	X	X	X	X	X	X		X	X	X	X	X	X		X
% Foot Ulcer	5.3.7	X	X	X	X	X	X	X		X			X		X		X

5.4 Terminal Outcomes

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Inc. Dialysis x100,000	5.4.1			X				X				X	X				X
% ESRF	5.4.2	X	X	X	X	X		X			X		X				X

Data Sources Contribution to BIRO Indicators (9)



6. Pediatric Indicators

6.1 Demographics

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Age	6.1.1	X		X	X	X		X	X				X	X	X	X	X

6.2 Diabetes Status

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Type of Diabetes	6.2.1	X		X	X	X		X	X				X	X	X	X	X
Duration of Diabetes	6.2.2	X		X	X	X		X	X				X	X	X	X	X

6.3 Control

	Indicator	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
HbA1c	6.3.1	X		X	X	X		X	X				X	X	X	X	X

Conclusions (1)



- After two rounds the First EUBIROD Diabetes Report has been finalized
- The report includes more details and delivers more readable outputs
- Software is much more stable
- The BIROBox now includes all steps for the global analysis: the report has been produced for the first time using the same interface available to all local users
- Statistical objects can be transmitted using the communication software
- Statistical objects include an origin descriptor adopting a unique BIRO UID
- The entire infrastructure may now be applied to a much wider community

Conclusions (2)

- The report can be now interpreted and directly used by clinical experts
- Now is your turn (after six years of hard technical work)!



Thanks for the attention!