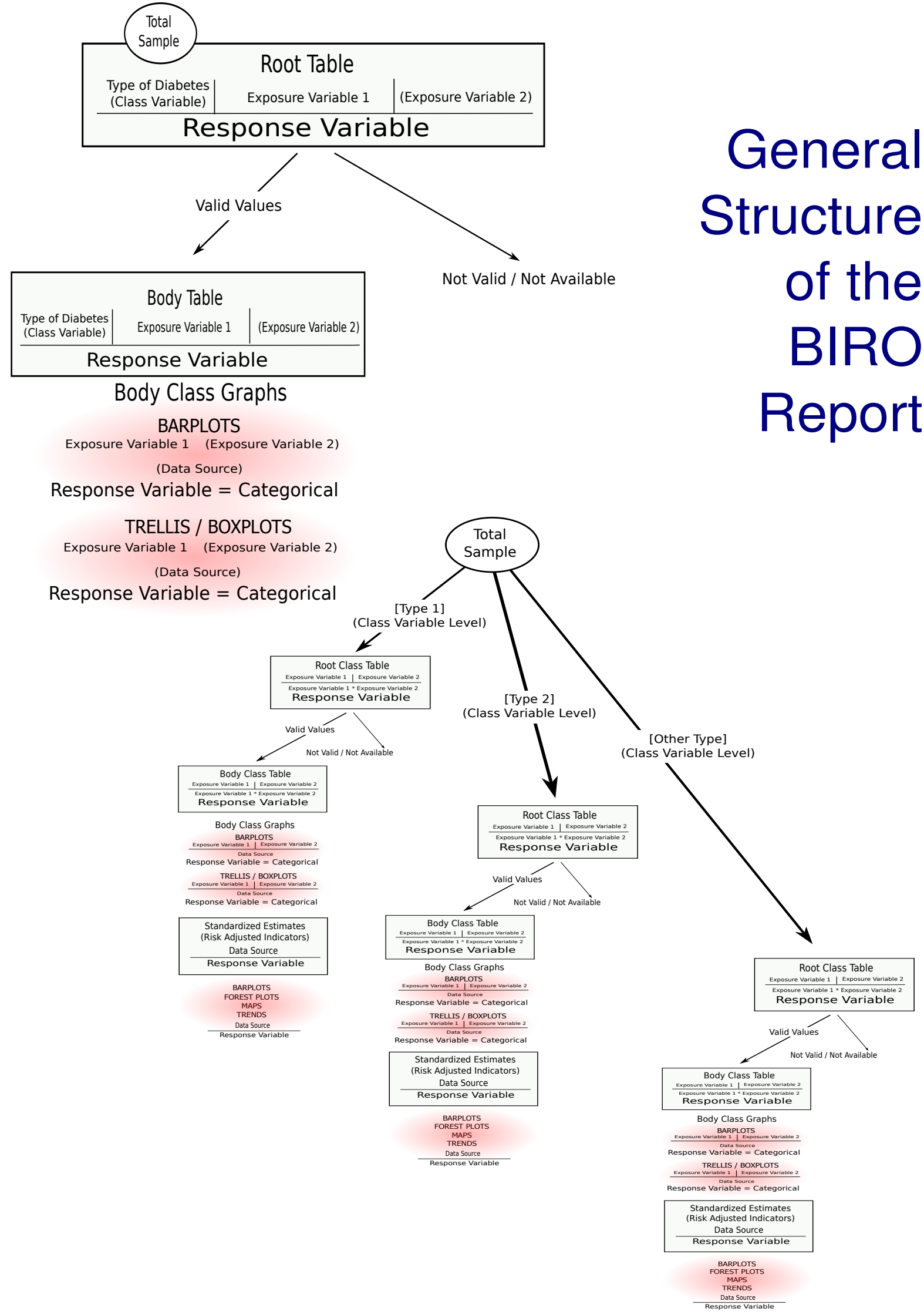
Appendix 1

Help Pages for EUBIROD Statistical Reports

General Structure of the BIRO Report



HOW TO READ THE BIRO REPORT
INTERPRETING ONE WAY TABLES

ONE WAY TABLES are used to tabulate the frequency of values for a target variable/indicator against a single exposure

Code and Description of the Indicator

Target Variable

2.2.3.1 Systolic BP (the most recent episode in 12 months)

Root Table
includes all observations in the input dataset

Response Variable

Exposure Variable

Valid Value

Not Valid / Not Available

SBP	Gender			
	Valid Value (%)	NV/NA (%)		N (%)
Valid Value	254 (79.9)	0(0.0)		254 (79.9)
NV/NA	64 (20.1)	0(0.0)		64 (20.1)
TOTAL	318(100.0)	0(0.0)		318 (100.0)

Table 2.2.3.1.3 - Missing Data: SBP * Gender

Within Table and Marginal Percentages are expressed as Column Percentages

Row Percentages

GRAND TOTAL for all tables: total number of observatoions in the overall sample

Caption: numbering is the same used for HTML and CSV outputs

Only Valid Values for all variables enter the Body Table

Column percentages allow to spot differences in the distribution of the Exposure Variable for each level of the response variable (ex: high levels of SBP are more frequent among females).
The Relative Risk (RR) for a specific class can be computed as [Col(1)%]/[Col(2)%]. Here Males/Females[160+]=13.6/17=0.8, i.e. Females have a 20% increased risk of falling in the upper level of SBP

SBP	Gender			
	Male (%)	Female (%)		N (%)
[0 - 130)	36 (23.4)	25(25.0)		61 (24.0)
[130 - 160)	97 (63.0)	58(58.0)		155 (61.0)
[160+)	21 (13.6)	17(17.0)		38 (15.0)
TOTAL	154(60.6)	100(39.4)		254 (100.0)

Table 2.2.3.1.4 - SBP * Gender

Row percentages highlight the weight of each level of the exposure variable on the total sample

Body Table
includes only Valid observations for all exposure and response variables

	CMH Chi-Square	p.value	df
Value	0.7721	0.6797	2

Chi-Square Table
Refers to the Body Table

The Chi-Square test provides a quick measure of the strength of the association between one or more exposures (stratified analysis) and the response of interest.
A p value < 0.05 is computed using the CMH Value together with the associated degrees of freedoms (df). It allows to reject the hypothesis of independence between the columns and the rows of the body table (ex.: the differences between males and female found in the body table do not support an association between gender and systolic blood pressure).

HOW TO READ THE BIRO REPORT
INTERPRETING GRAPHS FOR ONE WAY TABLES

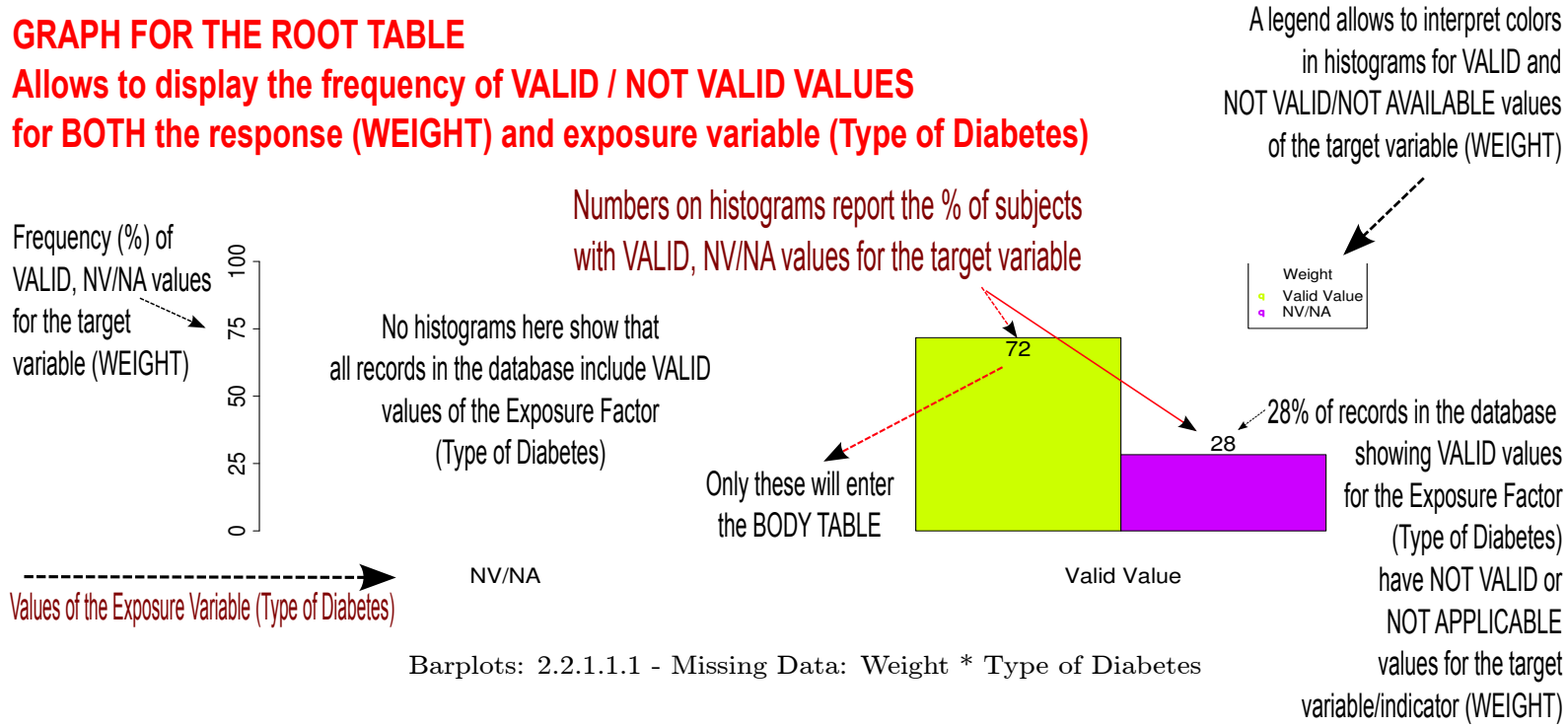
GRAPHS FOR ONE WAY TABLES are produced to provide a graphical display of the content of ONE WAY TABLES

Code and Description of the Indicator

Target Variable/Indicator

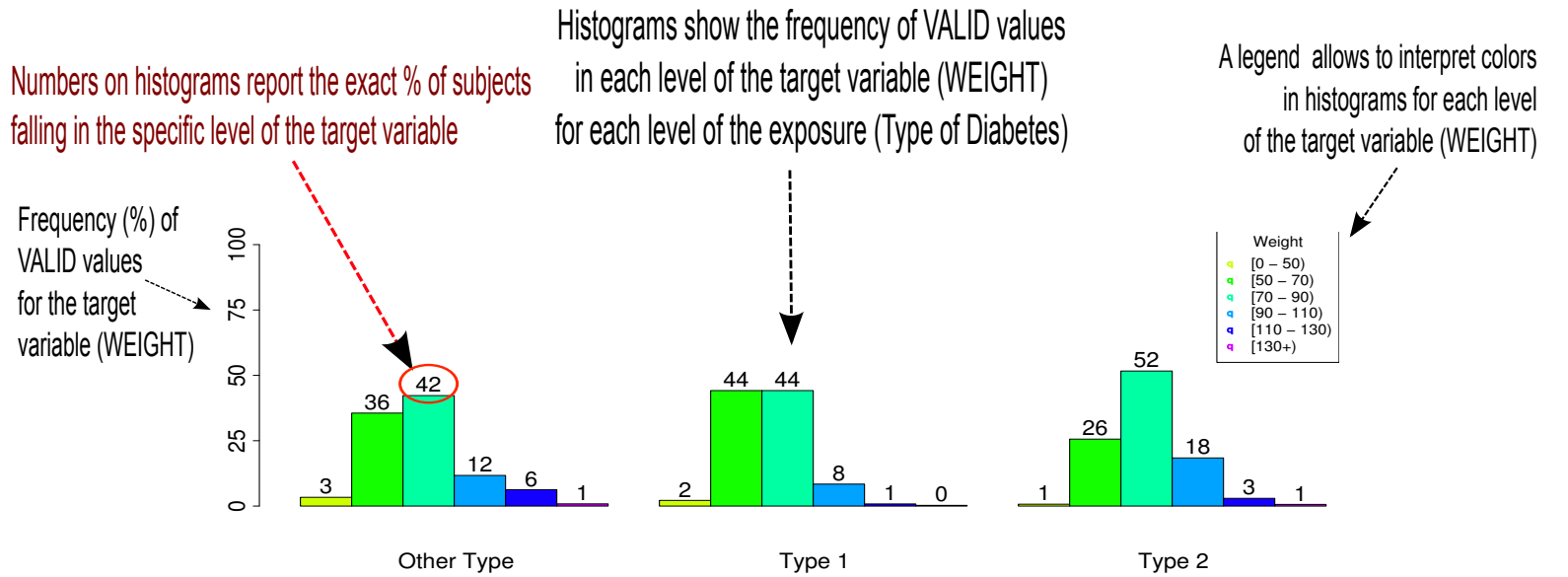
2.2.1.1 Weight (the most recent episode in 12 months)

GRAPH FOR THE ROOT TABLE
Allows to display the frequency of VALID / NOT VALID VALUES for BOTH the response (WEIGHT) and exposure variable (Type of Diabetes)



Barplots: 2.2.1.1.1 - Missing Data: Weight * Type of Diabetes

GRAPH FOR THE BODY TABLE
Allows to display the frequency of values for the response variable (WEIGHT) by levels of any exposure variable (Type of Diabetes)



Barplots: 2.2.1.1.2 - Weight * Type of Diabetes

HOW TO READ THE BIRO REPORT
BOXPLOTS

BOXPLOTS are used to provide an effective graphical display of the distribution of a continuous variable

Description of the Indicator

Target Variable (Continuous)

2.2.1.2 BMI (the most recent episode in 12 months)
Type of Diabetes = Type 2

Class Variable Level

The BOXPLOT is only valid for continuous variables (characteristics assuming a range of non-discrete values)

The bulk of the sample distribution (50%) of the target variable (ex:BMI) fall in this BOX

WHISKERS: 75%+1.5 times the difference between 75% and 25% percentiles (interquartile range): a measure of the expected range of values of the target variable: values beyond this limit are considered outliers

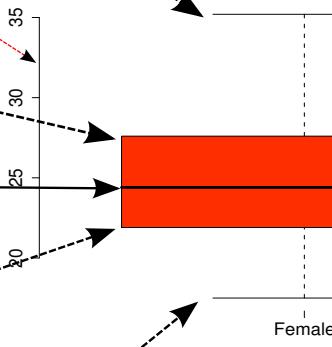
Scale of the Target Variable (BMI)

75% percentile: three quarters of the sample falll BELOW this BMI value

Median: 50% of the sample falll below this BMI value

25% percentile: three quarters of the sample falll ABOVE this BMI value

75%-1.5 times the difference between 75% and 25% percentiles



Smaller BOX means that the distribution of the target variable is LESS variable

The median BMI is higher among males than females

Borplots: 2.2.1.2.16 - BMI * Gender (Type of Diabetes = Type 2)

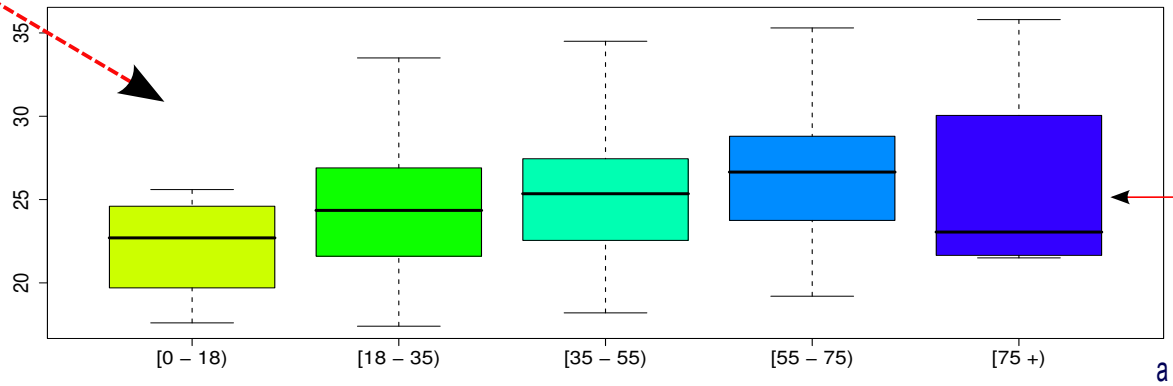
Target Variable

Stratification Factor (Exposuire)

Level of the Class Variable

Stratification Factors with many levels (Age Classes) allow exploring direct associations between increasing levels of the exposure, and values of the target variable.

Here, with the exception of those aged 75+, BMI linearly increases with AGE. Whiskers show that also the variation of BMI is linearly increasing with AGE.

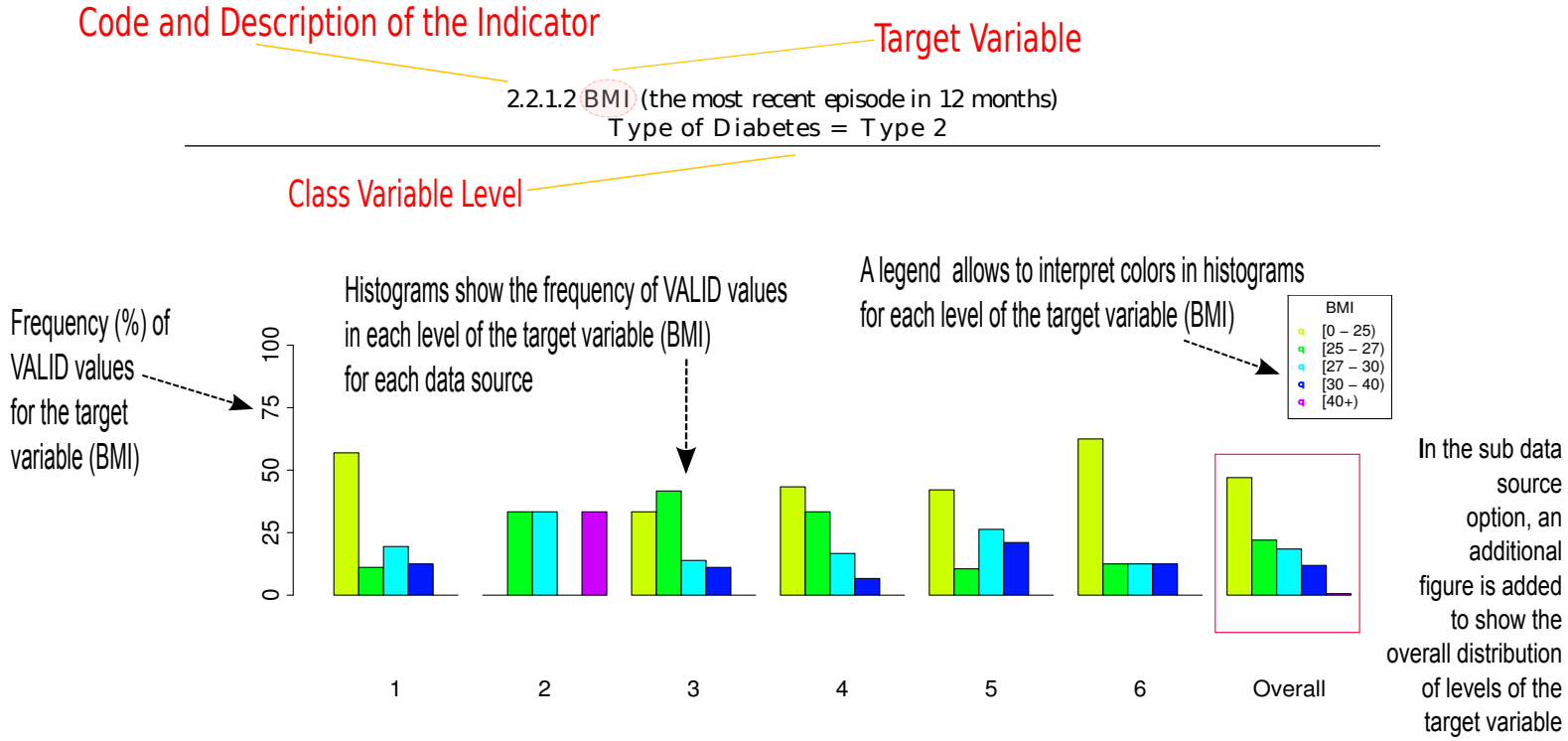


Asymmetric BOXES show that values are more concentrated (more frequent) on one side of the distribution of the target variable (skewness). This may indicate a deviation from normality

Borplots: 2.2.1.2.17 - BMI * Age (Type of Diabetes = Type 2)

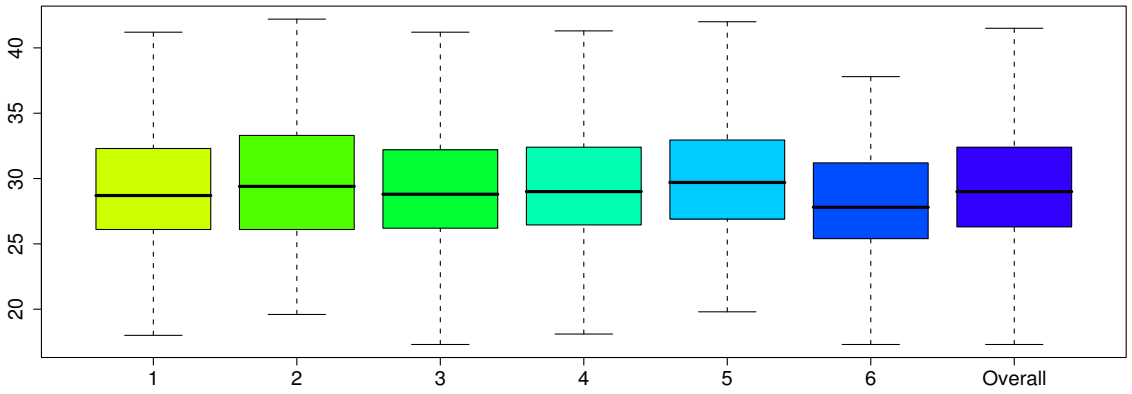
HOW TO READ THE BIRO REPORT
USING THE SUB DATA SOURCE OPTION

The SUB DATA SOURCE option can be used
to compare the distribution of a target response across centres



Barplots: 2.2.1.2.26 - BMI by data source (Age = [35 - 55), Type of Diabetes = Type 2)

In the SUB DATA SOURCE output, BOXPLOTS are used
to compare distributions across centres for continuous response variables



Boxplots: 2.2.1.2 3 - BMI by data source (Type of Diabetes = Type 2)

HOW TO READ THE BIRO REPORT
INTERPRETING TWO WAY TABLES

TWO WAY TABLES are used to tabulate the frequency of values for a target variable/indicator against two exposures

Code and Description of the Indicator

Target Variable/Indicator

5.2.1 % subjects with 1+ HbA1c tests during the last 12 months

Type of Diabetes = Type 2

Class Variable Level

Root Table

Two Way by Class Variable

Response Variable

BOTH values of Exposure Variables are Valid

At least one of the Exposure Variables is Not Valid / Not Available

Exposure Variable 1 * Exposure Variable 2

Valid Value

HbA1c done	Age*Gender				
	Valid Value		NV/NA		
	Valid Value (%)	NV/NA (%)	Valid Value (%)	NV/NA (%)	N (%)
Valid Value	8707 (100.0)	0 (0.0)	0 (0.0)	0(0.0)	8707 (100.0)
NV/NA	0 (0.0)	0 (0.0)	0 (0.0)	0(0.0)	0 (0.0)
TOTAL	8707(100.0)	0(0.0)	0(0.0)	0(0.0)	8707 (100.0)

Table 5.2.1.17 - Missing Data: HbA1c done * Age * Gender (Type of Diabetes = Type 2)

Within Table and Marginal Percentages are expressed as Column Percentages

Row Percentages

GRAND TOTAL for all tables: total number of observations in the overall sample

Caption: numbering is the same used for HTML and CSV outputs

HbA1c done	Age*Gender										
	Male					Female					
	[0 - 18) (%)	[18 - 35) (%)	[35 - 55) (%)	[55 - 75) (%)	[75 +) (%)	[0 - 18) (%)	[18 - 35) (%)	[35 - 55) (%)	[55 - 75) (%)	[75 +) (%)	N (%)
at least one test	0 (0.0)	13 (86.7)	542 (91.4)	2914 (95.3)	962 (92.9)	0 (0.0)	17 (94.4)	339 (89.4)	2230 (93.5)	1159(94.8)	8176 (93.9)
no test	0 (0.0)	2 (13.3)	51 (8.6)	143 (4.7)	74 (7.1)	1 (100.0)	1 (5.6)	40 (10.6)	155 (6.5)	64(5.2)	531 (6.1)
TOTAL	0(0.0)	15(0.2)	593(6.8)	3057(35.1)	1036(11.9)	1(0.0)	18(0.2)	379(4.4)	2385(27.4)	1223(14.0)	8707 (100.0)

Table 5.2.1.18 - HbA1c done * Age * Gender (Type of Diabetes = Type 2)

Body Table

Two Way by Class Variable

Row percentages highlight the weight of each level of the exposure variable on the total sample

Column percentages with two exposures allow to spot differences in terms of relative risk among an exposure and the response of interest for each level of a second exposure (ex: among subjects aged 55-75, the relative risk of not having an HbA1c test done, compared to females is RR=4.7/6.5=0.72)

CMH Chi-Square	
Value	One or more cells have 0 obs

Chi-Square Table

Refers to the Body Table

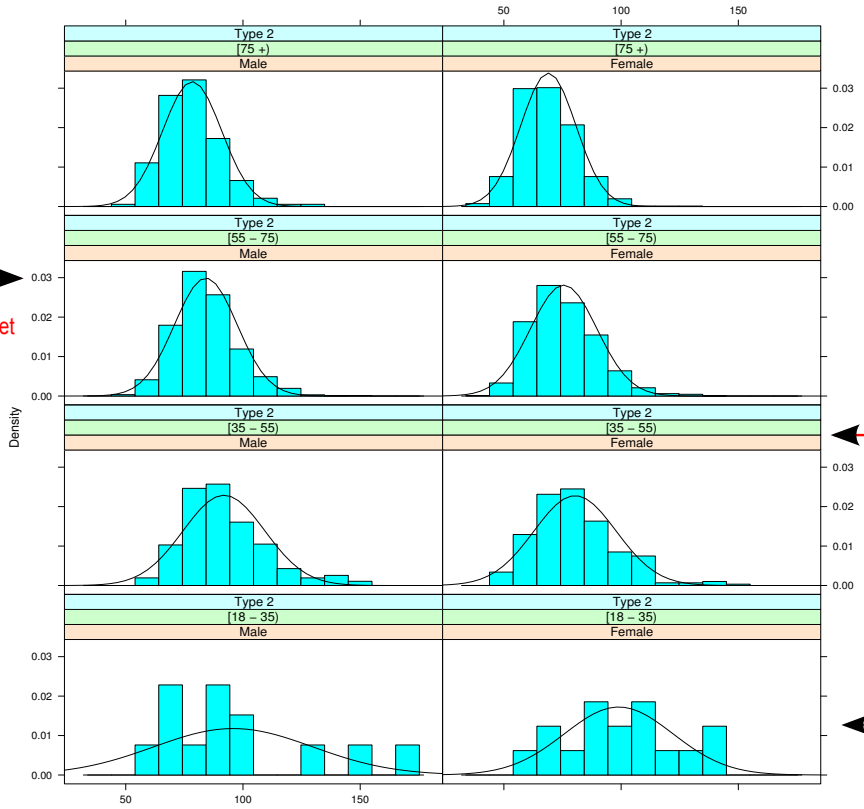
The Chi-Square test cannot be computed when one or more cells have less than 5 observations. This is frequently the case in two-way tables.

HOW TO READ THE BIRO REPORT

TRELLIS GRAPHS FROM TWO WAY TABLES

TRELLIS GRAPHS offer a flexible graphical representation of the distribution of a target CONTINUOUS RESPONSE VARIABLE for different levels of EXPOSURE FACTORS and CLASS VARIABLES

2.2.1.1 Weight (the most recent episode in 12 months)
Type of Diabetes = Type 2



Trellis density plot: 2.2.1.1.2 - Weight * Gender * Age (Type of Diabetes = Type 2)

The density plot explores the distribution of target continuous variable: WEIGHT, WITHIN the Level of the Class Variable "Type of Diabetes"=2

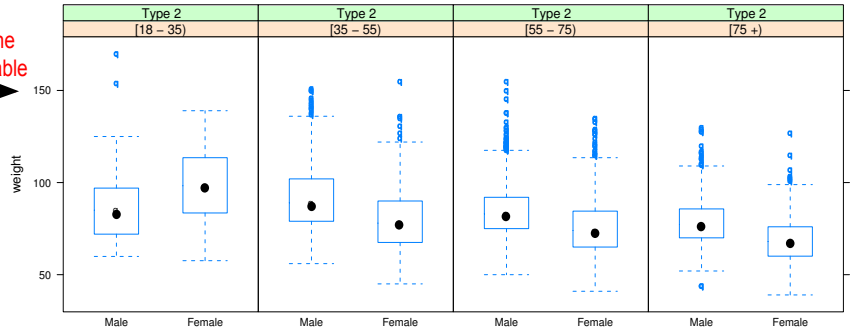
Each section of the TRELLIS displays the distribution of the target variable (WEIGHT) for a particular combination of exposure factors (age, gender).

Lines can be used to compare the distribution of one exposure (gender) within the same level of the other exposure (age).

Frequency of the Target Variable (WEIGHT)

The continuous variable (WEIGHT) is automatically divided in a number of classes of equal range to display the frequency distribution. A curve is superimposed to show the shape of the density and explore the level of heterogeneity among exposure classes.

Here, the shape of the distribution of WEIGHT among young subjects shows a wider variation than higher ages, particularly for males. The distribution in older subjects is fairly normal.



Boxplots: 2.2.1.1.21 - Weight * Gender * Age (Type of Diabetes = Type 2)

BOXPLOTS offer a synthetic view of the distribution of values (see BOXPLOT help for an explanation of the graph). Here, outlying values outside whiskers are highlighted by dots, showing a higher presence of extreme WEIGHT values in the central classes of age. The median value decreases with age. The median WEIGHT of males is constantly higher than females, except for younger subjects, for which holds the opposite.

VALUE of the Target Variable

HOW TO READ THE BIRO REPORT
RISK-ADJUSTED INDICATORS

RISK ADJUSTED INDICATORS include the estimation of expected values and adjusted rates based on multivariate modelling (logistic regression)

Description of the Indicator

% subjects with most recent HbA1c > 7,5 pct
Type of Diabetes = Type 2

Table of Standardized Results

Two Way by Class Variable

Class Variable Level

Sub Data Source

Expected no. Outcomes (based on Logistic Regression Model)

Crude Rate [O/N]

AR 95% CI based on AR Variance Estimation

Measures an Excess or Reduction of Observed Outcomes in a specific centre compared to the Expected % estimated using a reference logistic regression model (internal or external to the local population)

Observed no. Outcomes (Numerator)

Total no. Subjects (Denominator)

Adjusted Rate PR * [CR / (E/N)]

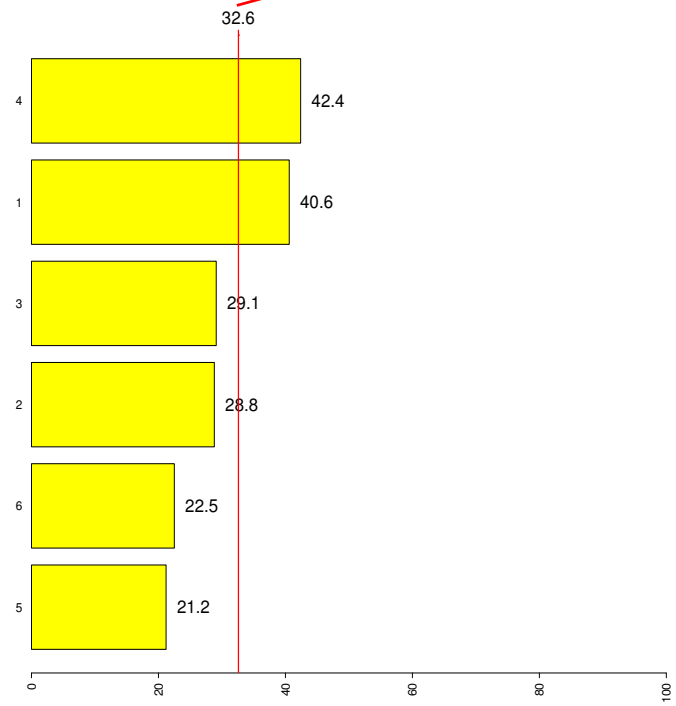
	s	O	E	N	CR	AR	95% C.I.	[O-E]/E %	95% C.I. [O-E]/E
1	4	429	330	1020	42.1	42.4	(39.5; 45.3)	30.0	(21.1; 38.9)
2	1	957	768	2357	40.6	40.6	(38.8; 42.5)	24.6	(18.8; 30.4)
3	3	734	824	2530	29.0	29.1	(27.2; 30.9)	-10.9	(-16.5; -5.3)
4	2	228	258	791	28.8	28.8	(25.6; 32.1)	-11.6	(-21.6; -1.7)
5	6	67	97	296	22.6	22.5	(17.2; 27.8)	-30.9	(-47.1;-14.8)
6	5	252	388	1182	21.3	21.2	(18.5; 23.8)	-35.1	(-43.1;-27.0)
	T	2667		8176	32.6				

Ranking

95% C.I. of O-E/E%
If the interval DOES NOT CROSS ZERO any excess/reduction IS statistically significant at alpha=0.05

Total no. Subjects

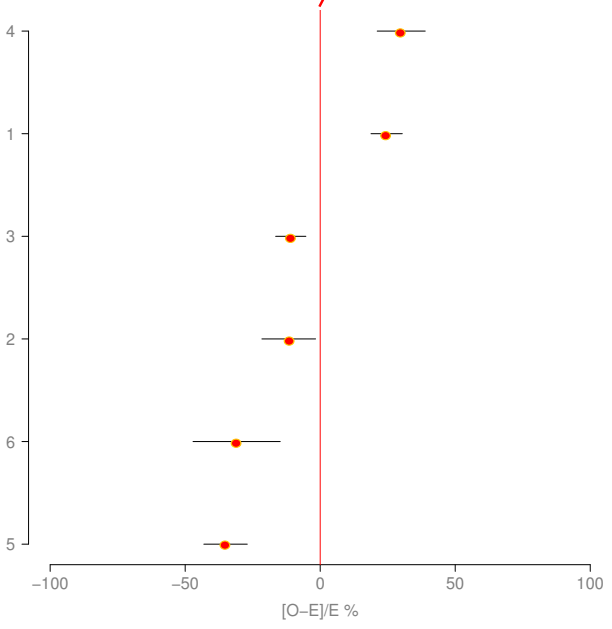
Population Rate (PR)



Barplots: 5.3.2.29 - Adjusted Rates % subjects with most recent HbA1c > 7,5 pct

Graphical Representation of Standardized Rates

Centres are ordered by Descending Adjusted Rates



Forest plots: 5.3.2.1 - % subjects with most recent HbA1c > 7,5 pct

Graphical Representation of O-E/E% with 95% Confidence Intervals

Statistically Significant Excess/Reductions are highlighted by lines not intersecting the zero line