Reporting

Descriptive analysis and basic statistics in biomedical studies using R and Markdown

Juan R Gonzalez
juanr.gonzalez@isglobal.org

BRGE - Bioinformatics Research Group in Epidemiology
ISGlobal - Barcelona Institute for Global Health
http://brge.isglobal.org

IACS - Instituto Aragonés de Ciencias de la Salud
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R facilitates data description and reproducible research

- Patients characteristics comparision

Characteristics	Cases (n = 416) %	Controls (n = 1156) %	Value of p^a
Han race	97.58	96.39	0.25
Education			
None/elementary/high school	71.57	69.24	
Professional/college+	28.43	30.76	0.38
Occupation status			
Physical work	55.42	50.18	
Mental work	44.58	49.82	0.07
BMI [kg/m^2]			
Mean ± SD	23.77 ±3.60	23.21 ±2.93	0.01
≥ 24	41.71	34.93	0.05

Figure 1: Baseline comparison table of a standard case-control study

- Odds ratio estimation

Food group	Odds ratio (95% CI) for		
	Colon cancer	Rectal cancer	Colon and rectal cancers
Refined grain	1.46(1.20–1.78)	1.21(0.99–1.49)	1.32(1.12–1.56)
Whole grain	0.92(0.80–1.07)	0.86(0.72–1.02)	0.85(0.75–0.97)
Red meat	1.63(1.30–2.04)	1.50(1.20–1.88)	1.54(1.28–1.85)
Pork and processed meat	1.34(1.17–1.53)	1.18(1.02–1.37)	1.27(1.13–1.43)
Cheese	1.10(0.99–1.22)	1.07(0.94–1.21)	1.09(0.98–1.22)
Raw vegetables	0.90(0.76–1.07)	0.84(0.69–1.01)	0.85(0.74–0.98)
Cooked vegetables	0.69(0.54–0.88)	0.78(0.61–0.99)	0.69(0.57–0.83)
Citrus fruit	0.90(0.79–1.03)	0.84(0.72–0.98)	0.86(0.78–0.96)
Other fruits	0.84(0.71–0.99)	0.87(0.74–1.03)	0.85(0.75–0.96)
Alcohol	1.22(1.04–1.43)	1.38(1.16–1.63)	1.28(1.11–1.48)
Coffee	0.71(0.55–0.92)	0.79(0.62–1.00)	0.73(0.60–0.88)

[a]Adjusted for age, sex, education, smoking, alcohol, body mass index, physical activity and total energy intake.

##

compareGroups

`compareGroups` is an R package available on CRAN to create descriptive tables

It consists of three key funcions:

1. `compareGroups~` generates all the calculation
2. `createTable~` creates the descriptive table obtained by `compareGroups`. You can costumize it by excluding categories,

Example

PREDIMED project:

http://www.cat.isciii.es/ISCIII/es/contenidos/fd-el-instituto/fd-comunicacion/fd-noticias/PREDIMED-2013.pdf

1. Load the package and the example data existing in `compareGroups` package

```
library(compareGroups)
data(predimed)
# ?predimed
```

```
head(predimed)
```

```
           group    sex age   smoke   bmi waist       wth htn diab hyperchol
1        Control   Male  58  Former 33.53   122 0.7530864  No   No        Yes
2        Control   Male  77 Current 31.05   119 0.7300614 Yes  Yes         No
4  MedDiet + VOO Female  72  Former 30.86   106 0.6543210  No  Yes         No
5 MedDiet + Nuts   Male  71  Former 27.68   118 0.6941177 Yes   No        Yes
6  MedDiet + VOO Female  79   Never 35.94   129 0.8062500 Yes   No        Yes
8        Control   Male  63  Former 41.66   143 0.8033708 Yes  Yes        Yes
  famhist hormo p14  toevent event
1      No    No  10 5.374401   Yes
2      No    No  10 6.097194    No
4     Yes    No   8 5.946612    No
5      No    No   8 2.907598   Yes
```

2. Compute descriptives and other figures by treatment group

- Use of formula environment to select variables.
- On left hand side write the variable indicating groups (nothing indicates that descriptive analyses will be performed for the whole database).
- On the right side write all the variables you want to describe by the grouping variable

```
descr <- compareGroups(group ~ sex + age + smoke, predimed)
descr
```

```
-------- Summary of results by groups of 'Intervention group'---------


  var     N    p.value  method            selection
1 Sex     6324 <0.001** categorical       ALL
2 Age     6324 0.003**  continuous normal ALL
3 Smoking 6324 0.444    categorical       ALL
-----
Signif. codes:  0 '**' 0.05 '*' 0.1 ' ' 1
```

- If you are interested in describing all variables use ‘.’

```
descr <- compareGroups(group ~ ., predimed)
descr
```

```
-------- Summary of results by groups of 'Intervention group'---------


   var                                N    p.value  method            selection
1  Sex                                6324 <0.001** categorical       ALL
2  Age                                6324 0.003**  continuous normal ALL
3  Smoking                            6324 0.444    categorical       ALL
4  Body mass index                    6324 <0.001** continuous normal ALL
5  Waist circumference                6324 0.045**  continuous normal ALL
6  Waist-to-height ratio              6324 <0.001** continuous normal ALL
7  Hypertension                       6324 0.249    categorical       ALL
8  Type-2 diabetes                    6324 0.017**  categorical       ALL
9  Dyslipidemia                       6324 0.423    categorical       ALL
10 Family history of premature CHD    6324 0.581    categorical       ALL
11 Hormone-replacement therapy        5661 0.850    categorical       ALL
12 MeDiet Adherence score             6324 <0.001** continuous normal ALL
13 follow-up to main event (years)    6324 <0.001** continuous normal ALL
14 AMI, stroke, or CV Death           6324 0.064*   categorical       ALL
-----
Signif. codes:  0 '**' 0.05 '*' 0.1 ' ' 1
```

- If you are inerested in describing all variables but a subset of them use '-' (this is useful when having variables such us 'id', 'hc', 'name', . . .)

```
descr2 <- compareGroups(group ~ . -sex -age -event, predimed)
descr2
```

```
-------- Summary of results by groups of 'Intervention group'---------


   var                              N    p.value  method            selection
1  Smoking                          6324 0.444    categorical       ALL
2  Body mass index                  6324 <0.001** continuous normal ALL
3  Waist circumference              6324 0.045**  continuous normal ALL
4  Waist-to-height ratio            6324 <0.001** continuous normal ALL
5  Hypertension                     6324 0.249    categorical       ALL
6  Type-2 diabetes                  6324 0.017**  categorical       ALL
7  Dyslipidemia                     6324 0.423    categorical       ALL
8  Family history of premature CHD 6324 0.581    categorical       ALL
9  Hormone-replacement therapy      5661 0.850    categorical       ALL
10 MeDiet Adherence score           6324 <0.001** continuous normal ALL
11 follow-up to main event (years) 6324 <0.001** continuous normal ALL
-----
Signif. codes:  0 '**' 0.05 '*' 0.1 ' ' 1
```

3. Build the descriptive table.

```
descrtable <- createTable(descr)
descrtable
```

```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________________________
                                    Control     MedDiet + Nuts MedDiet + VOO p.overall
                                     N=2042         N=2100         N=2182
_____________________________________________________________________________________
Sex:                                                                             <0.001
    Male                        812 (39.8%)   968 (46.1%)    899 (41.2%)
    Female                      1230 (60.2%)  1132 (53.9%)   1283 (58.8%)
Age                             67.3 (6.28)   66.7 (6.02)    67.0 (6.21)        0.003
Smoking:                                                                         0.444
    Never                       1282 (62.8%)  1259 (60.0%)   1351 (61.9%)
    Current                     270 (13.2%)   296 (14.1%)    292 (13.4%)
    Former                      490 (24.0%)   545 (26.0%)    539 (24.7%)
Body mass index                 30.3 (3.96)   29.7 (3.77)    29.9 (3.71)       <0.001
Waist circumference              101 (10.8)    100 (10.6)     100 (10.4)        0.045
Waist-to-height ratio           0.63 (0.07)   0.62 (0.06)    0.63 (0.06)       <0.001
Hypertension:                                                                    0.249
    No                          331 (16.2%)   362 (17.2%)    396 (18.1%)
    Yes                         1711 (83.8%)  1738 (82.8%)   1786 (81.9%)
Type-2 diabetes:                                                                 0.017
    No                          1072 (52.5%)  1150 (54.8%)   1100 (50.4%)
    Yes                         970 (47.5%)   950 (45.2%)    1082 (49.6%)
Dyslipidemia:                                                                    0.423
    No                          563 (27.6%)   561 (26.7%)    622 (28.5%)
    Yes                         1479 (72.4%)  1539 (73.3%)   1560 (71.5%)
Family history of premature CHD:                                                 0.581
```

Customizing results

- Hide 'No' category

```
update(descrtable, hide.no='no')
```

```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________________________
                                  Control    MedDiet + Nuts MedDiet + VOO p.overall
                                   N=2042        N=2100        N=2182
_____________________________________________________________________________________
Sex:                                                                          <0.001
    Male                      812 (39.8%)   968 (46.1%)    899 (41.2%)
    Female                    1230 (60.2%)  1132 (53.9%)  1283 (58.8%)
Age                           67.3 (6.28)   66.7 (6.02)    67.0 (6.21)     0.003
Smoking:                                                                      0.444
    Never                     1282 (62.8%)  1259 (60.0%)  1351 (61.9%)
    Current                   270 (13.2%)   296 (14.1%)    292 (13.4%)
    Former                    490 (24.0%)   545 (26.0%)    539 (24.7%)
Body mass index               30.3 (3.96)   29.7 (3.77)    29.9 (3.71)    <0.001
Waist circumference            101 (10.8)    100 (10.6)     100 (10.4)     0.045
Waist-to-height ratio         0.63 (0.07)   0.62 (0.06)    0.63 (0.06)    <0.001
Hypertension                  1711 (83.8%)  1738 (82.8%)  1786 (81.9%)    0.249
Type-2 diabetes               970 (47.5%)   950 (45.2%)   1082 (49.6%)    0.017
Dyslipidemia                  1479 (72.4%)  1539 (73.3%)  1560 (71.5%)    0.423
Family history of premature CHD 462 (22.6%) 460 (21.9%)    507 (23.2%)    0.581
Hormone-replacement therapy    31 (1.68%)    30 (1.61%)    36 (1.84%)     0.850
MeDiet Adherence score        8.44 (1.94)   8.81 (1.90)    8.77 (1.97)    <0.001
follow-up to main event (years) 4.09 (1.74) 4.31 (1.70)    4.64 (1.60)    <0.001
AMI, stroke, or CV Death       97 (4.75%)    70 (3.33%)    85 (3.90%)     0.064
```

- Show number of valid data

```
update(descrtable, hide.no='no', show.n = TRUE)
```

--------Summary descriptives table by 'Intervention group'---------

	Control N=2042	MedDiet + Nuts N=2100	MedDiet + VOO N=2182	p.overall	N
Sex:				<0.001	6324
Male	812 (39.8%)	968 (46.1%)	899 (41.2%)		
Female	1230 (60.2%)	1132 (53.9%)	1283 (58.8%)		
Age	67.3 (6.28)	66.7 (6.02)	67.0 (6.21)	0.003	6324
Smoking:				0.444	6324
Never	1282 (62.8%)	1259 (60.0%)	1351 (61.9%)		
Current	270 (13.2%)	296 (14.1%)	292 (13.4%)		
Former	490 (24.0%)	545 (26.0%)	539 (24.7%)		
Body mass index	30.3 (3.96)	29.7 (3.77)	29.9 (3.71)	<0.001	6324
Waist circumference	101 (10.8)	100 (10.6)	100 (10.4)	0.045	6324
Waist-to-height ratio	0.63 (0.07)	0.62 (0.06)	0.63 (0.06)	<0.001	6324
Hypertension	1711 (83.8%)	1738 (82.8%)	1786 (81.9%)	0.249	6324
Type-2 diabetes	970 (47.5%)	950 (45.2%)	1082 (49.6%)	0.017	6324
Dyslipidemia	1479 (72.4%)	1539 (73.3%)	1560 (71.5%)	0.423	6324
Family history of premature CHD	462 (22.6%)	460 (21.9%)	507 (23.2%)	0.581	6324
Hormone-replacement therapy	31 (1.68%)	30 (1.61%)	36 (1.84%)	0.850	5661
MeDiet Adherence score	8.44 (1.94)	8.81 (1.90)	8.77 (1.97)	<0.001	6324
follow-up to main event (years)	4.09 (1.74)	4.31 (1.70)	4.64 (1.60)	<0.001	6324
AMI, stroke, or CV Death	97 (4.75%)	70 (3.33%)	85 (3.90%)	0.064	6324

- Show only relative percentages

```
update(descrtable, hide.no='no', show.n = TRUE, type=1)
```

```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________________________
                                  Control   MedDiet + Nuts MedDiet + VOO p.overall  N
                                  N=2042        N=2100        N=2182
_____________________________________________________________________________________
Sex:                                                                    <0.001   6324
    Male                            39.8%         46.1%         41.2%
    Female                          60.2%         53.9%         58.8%
Age                           67.3 (6.28)   66.7 (6.02)   67.0 (6.21)    0.003   6324
Smoking:                                                                0.444   6324
    Never                           62.8%         60.0%         61.9%
    Current                         13.2%         14.1%         13.4%
    Former                          24.0%         26.0%         24.7%
Body mass index               30.3 (3.96)   29.7 (3.77)   29.9 (3.71)   <0.001   6324
Waist circumference           101 (10.8)     100 (10.6)    100 (10.4)     0.045   6324
Waist-to-height ratio         0.63 (0.07)   0.62 (0.06)   0.63 (0.06)   <0.001   6324
Hypertension                    83.8%         82.8%         81.9%         0.249   6324
Type-2 diabetes                 47.5%         45.2%         49.6%         0.017   6324
Dyslipidemia                    72.4%         73.3%         71.5%         0.423   6324
Family history of premature CHD 22.6%         21.9%         23.2%         0.581   6324
Hormone-replacement therapy      1.68%         1.61%         1.84%         0.850   5661
MeDiet Adherence score        8.44 (1.94)   8.81 (1.90)   8.77 (1.97)   <0.001   6324
follow-up to main event (years) 4.09 (1.74) 4.31 (1.70)   4.64 (1.60)   <0.001   6324
AMI, stroke, or CV Death        4.75%         3.33%         3.90%         0.064   6324
_____________________________________________________________________________________
```

Customizing descriptives (tests)

- By default, `compareGroups` report means and SD, and performs t-test or ANOVA for continous variables.
- To report medians and quartiles and perform Kruskall-Wallis tests for continuous variable:

```
descr <- update(descr, method=2)
createTable(descr, hide.no="no")
```

```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________________________
                                    Control       MedDiet + Nuts    MedDiet + VOO   p.overall
                                     N=2042          N=2100            N=2182
_____________________________________________________________________________________
Sex:                                                                                <0.001
    Male                          812 (39.8%)      968 (46.1%)      899 (41.2%)
    Female                        1230 (60.2%)     1132 (53.9%)     1283 (58.8%)
Age                             67.0 [62.0;72.0] 66.0 [62.0;71.0] 67.0 [62.0;72.0]   0.003
Smoking:                                                                            0.444
    Never                         1282 (62.8%)     1259 (60.0%)     1351 (61.9%)
    Current                       270 (13.2%)      296 (14.1%)      292 (13.4%)
    Former                        490 (24.0%)      545 (26.0%)      539 (24.7%)
Body mass index                 30.0 [27.5;32.8] 29.5 [26.9;32.2] 29.7 [27.2;32.4]  <0.001
Waist circumference              101 [94.0;108]   100 [93.0;107]   100 [93.0;107]    0.085
Waist-to-height ratio           0.63 [0.59;0.68] 0.62 [0.58;0.66] 0.62 [0.58;0.67]  <0.001
Hypertension                      1711 (83.8%)     1738 (82.8%)     1786 (81.9%)     0.249
```

- Change number of decimals

```
update(descrtable, hide.no='no', digits=1, digits.p=5)
```

```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________________________________
                                    Control          MedDiet + Nuts      MedDiet + VOO    p.overall
                                     N=2042             N=2100             N=2182
_____________________________________________________________________________________________
Sex:                                                                                     0.00008
    Male                          812 (39.8%)        968 (46.1%)        899 (41.2%)
    Female                       1230 (60.2%)       1132 (53.9%)       1283 (58.8%)
Age                           67.0 [62.0;72.0]   66.0 [62.0;71.0]   67.0 [62.0;72.0]    0.00299
Smoking:                                                                                 0.44435
    Never                         1282 (62.8%)       1259 (60.0%)       1351 (61.9%)
    Current                        270 (13.2%)        296 (14.1%)        292 (13.4%)
    Former                         490 (24.0%)        545 (26.0%)        539 (24.7%)
Body mass index               30.0 [27.5;32.8]   29.5 [26.9;32.2]   29.7 [27.2;32.4]    0.00002
Waist circumference          101.0 [94.0;108.0] 100.0 [93.0;107.0] 100.0 [93.0;107.0]  0.08460
Waist-to-height ratio          0.6 [0.6;0.7]      0.6 [0.6;0.7]      0.6 [0.6;0.7]     0.00019
Hypertension                   1711 (83.8%)       1738 (82.8%)       1786 (81.9%)      0.24876
Type-2 diabetes                970 (47.5%)        950 (45.2%)        1082 (49.6%)      0.01725
Dyslipidemia                   1479 (72.4%)       1539 (73.3%)       1560 (71.5%)      0.42297
Family history of premature CHD 462 (22.6%)       460 (21.9%)        507 (23.2%)       0.58131
Hormone-replacement therapy     31 (1.7%)          30 (1.6%)          36 (1.8%)         0.85009
MeDiet Adherence score         8.0 [7.0;10.0]     9.0 [8.0;10.0]     9.0 [8.0;10.0]    <0.00001
follow-up to main event (years) 4.2 [2.7;5.6]     4.7 [2.8;5.8]      5.0 [3.4;5.9]     <0.00001
AMI, stroke, or CV Death       97 (4.8%)          70 (3.3%)          85 (3.9%)         0.06386
_____________________________________________________________________________________________
```

- Perform medians and quantiles for some variables:

```
descr <- update(descr, method=c(age=2, p14=2))
createTable(descr, hide.no="no")
```

--------Summary descriptives table by 'Intervention group'---------

	Control N=2042	MedDiet + Nuts N=2100	MedDiet + VOO N=2182	p.overall
Sex:				<0.001
Male	812 (39.8%)	968 (46.1%)	899 (41.2%)	
Female	1230 (60.2%)	1132 (53.9%)	1283 (58.8%)	
Age	67.0 [62.0;72.0]	66.0 [62.0;71.0]	67.0 [62.0;72.0]	0.003
Smoking:				0.444
Never	1282 (62.8%)	1259 (60.0%)	1351 (61.9%)	
Current	270 (13.2%)	296 (14.1%)	292 (13.4%)	
Former	490 (24.0%)	545 (26.0%)	539 (24.7%)	
Body mass index	30.3 (3.96)	29.7 (3.77)	29.9 (3.71)	<0.001
Waist circumference	101 (10.8)	100 (10.6)	100 (10.4)	0.045
Waist-to-height ratio	0.63 (0.07)	0.62 (0.06)	0.63 (0.06)	<0.001
Hypertension	1711 (83.8%)	1738 (82.8%)	1786 (81.9%)	0.249
Type-2 diabetes	970 (47.5%)	950 (45.2%)	1082 (49.6%)	0.017
Dyslipidemia	1479 (72.4%)	1539 (73.3%)	1560 (71.5%)	0.423
Family history of premature CHD	462 (22.6%)	460 (21.9%)	507 (23.2%)	0.581
Hormone-replacement therapy	31 (1.68%)	30 (1.61%)	36 (1.84%)	0.850
MeDiet Adherence score	8.00 [7.00;10.0]	9.00 [8.00;10.0]	9.00 [8.00;10.0]	<0.001
follow-up to main event (years)	4.09 (1.74)	4.31 (1.70)	4.64 (1.60)	<0.001
AMI, stroke, or CV Death	97 (4.75%)	70 (3.33%)	85 (3.90%)	0.064

Odds Ratio

- Place the case/control variable on left hand side.
- It computes the Odds Ratio (OR) of being a case (second category). To change reference category, use `ref.y` argument from `compareGroups` function.
- Let's report the OR of being hyperchol

```
table(predimed$hyperchol)
```

```
  No  Yes
1746 4578
```

```r
descr <- compareGroups(hyperchol ~ ., predimed)
createTable(descr, hide.no="no", show.ratio=TRUE,
            show.p.overall=FALSE, show.p.trend = FALSE)
```

--------Summary descriptives table by 'Dyslipidemia'---------

	No N=1746	Yes N=4578	OR	p.ratio
Intervention group:				
Control	563 (32.2%)	1479 (32.3%)	Ref.	Ref.
MedDiet + Nuts	561 (32.1%)	1539 (33.6%)	1.04 [0.91;1.20]	0.536
MedDiet + VOO	622 (35.6%)	1560 (34.1%)	0.95 [0.83;1.09]	0.499
Sex:				
Male	906 (51.9%)	1773 (38.7%)	Ref.	Ref.
Female	840 (48.1%)	2805 (61.3%)	1.71 [1.53;1.91]	0.000
Age	67.6 (6.23)	66.8 (6.14)	0.98 [0.97;0.99]	<0.001
Smoking:				
Never	980 (56.1%)	2912 (63.6%)	Ref.	Ref.
Current	291 (16.7%)	567 (12.4%)	0.66 [0.56;0.77]	<0.001
Former	475 (27.2%)	1099 (24.0%)	0.78 [0.68;0.89]	<0.001
Body mass index	30.0 (3.89)	29.9 (3.79)	0.99 [0.98;1.01]	0.353
Waist circumference	101 (10.4)	100.0 (10.6)	0.99 [0.98;0.99]	<0.001
Waist-to-height ratio	0.63 (0.07)	0.63 (0.07)	0.49 [0.21;1.13]	0.096
Hypertension	1337 (76.6%)	3898 (85.1%)	1.75 [1.53;2.01]	<0.001
Type-2 diabetes	1222 (70.0%)	1780 (38.9%)	0.27 [0.24;0.31]	0.000
Family history of premature CHD	409 (23.4%)	1020 (22.3%)	0.94 [0.82;1.07]	0.331
Hormone-replacement therapy	26 (1.65%)	71 (1.74%)	1.05 [0.67;1.68]	0.844
MeDiet Adherence score	8.68 (1.90)	8.68 (1.96)	1.00 [0.97;1.03]	0.995
follow-up to main event (years)	4.59 (1.63)	4.26 (1.71)	0.89 [0.86;0.92]	<0.001
AMI, stroke, or CV Death	101 (5.78%)	151 (3.30%)	0.56 [0.43;0.72]	<0.001

Hazard Ratios

- PREDIMED is a cohort study with time-to-event outcome.
- Descriptives by cases and controls, HR taking into account time-to-event response (with possible right censoring) and and p-values are easily computed

1. First, create a Surv variable

```
predimed$tevent <- with(predimed, Surv(toevent, event=="Yes"))
```

2. Then write this variable on left side of ~ in compareGroups. Note the use of - to erase some variables.

```
descr <- compareGroups(tevent ~ .- toevent-event, predimed)
createTable(descr, hide.no="no", show.ratio=TRUE,
            show.p.overall=FALSE)
```

```
--------Summary descriptives table by 'tevent'---------

_____________________________________________________________________________
                                No event      Event           HR        p.ratio
                                 N=6072       N=252
_____________________________________________________________________________
Intervention group:
    Control                  1945 (32.0%) 97 (38.5%)        Ref.        Ref.
    MedDiet + Nuts           2030 (33.4%) 70 (27.8%)  0.66 [0.48;0.89]  0.008
    MedDiet + VOO            2097 (34.5%) 85 (33.7%)  0.70 [0.53;0.94]  0.018
Sex:
    Male                     2528 (41.6%) 151 (59.9%)       Ref.        Ref.
    Female                   3544 (58.4%) 101 (40.1%) 0.49 [0.38;0.63] <0.001
Age                          66.9 (6.14)  69.4 (6.65) 1.06 [1.04;1.09] <0.001
Smoking:
    Never                    3778 (62.2%) 114 (45.2%)       Ref.        Ref.
    Current                  809 (13.3%)  49 (19.4%)  1.96 [1.40;2.74] <0.001
```

Utilities

- use `label` function from Hmisc package to label variables

```
label(predimed$age) <- "Age of participant"
```

- To know the original variable names (instead of labels)

```
descrtable <- createTable(compareGroups(group ~ ., predimed))
varinfo(descrtable)
```

```
--- Analyzed variable names ----

   Orig varname Shown varname
1  group        Intervention group
2  sex          Sex
3  age          Age of participant
4  smoke        Smoking
5  bmi          Body mass index
6  waist        Waist circumference
7  wth          Waist-to-height ratio
8  htn          Hypertension
9  diab         Type-2 diabetes
10 hyperchol    Dyslipidemia
11 famhist      Family history of premature CHD
12 hormo        Hormone-replacement therapy
13 p14          MeDiet Adherence score
14 toevent      follow-up to main event (years)
```

- To select some variables use [], indexing by names or by position

```
descrtable <- createTable(compareGroups(group ~ ., predimed))
descrtable[c('age','bmi')]
```

```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________
                     Control   MedDiet + Nuts MedDiet + VOO p.overall
                     N=2042        N=2100        N=2182
_____________________________________________________________________
Age of participant 67.3 (6.28)  66.7 (6.02)    67.0 (6.21)    0.003
Body mass index    30.3 (3.96)  29.7 (3.77)    29.9 (3.71)   <0.001
_____________________________________________________________________
```

```
descrtable[c(1,4)]
```

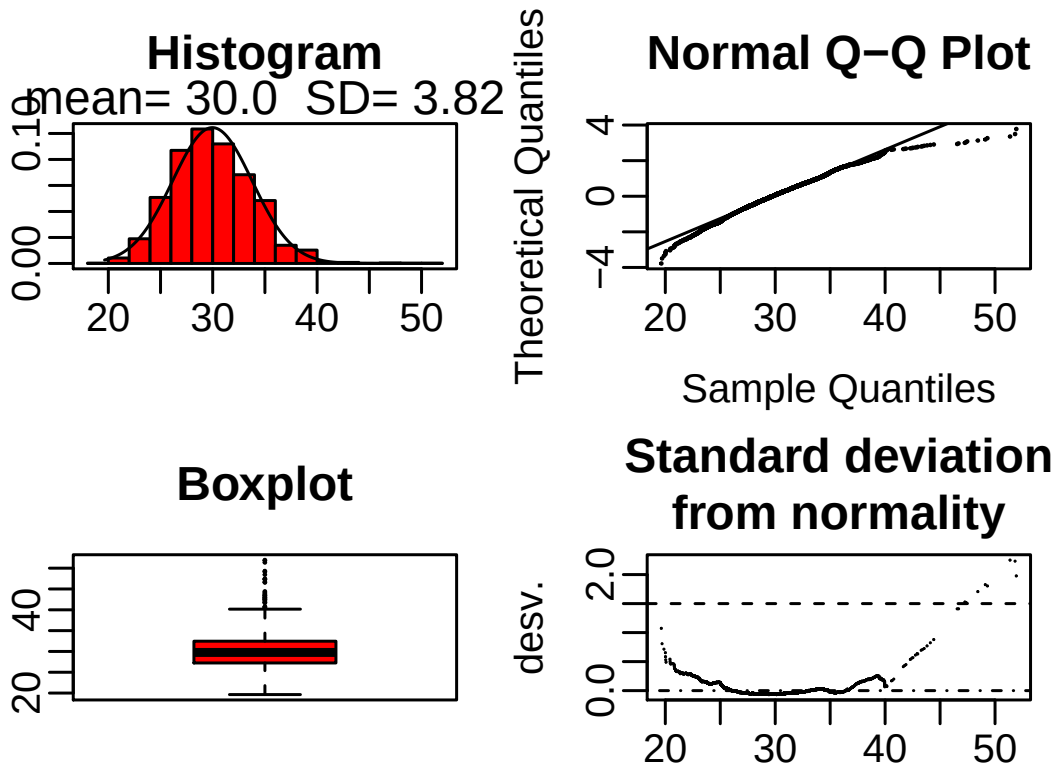
```
--------Summary descriptives table by 'Intervention group'---------

_____________________________________________________________________
                   Control    MedDiet + Nuts MedDiet + VOO p.overall
                    N=2042        N=2100        N=2182
_____________________________________________________________________
Sex:                                                        <0.001
    Male         812 (39.8%)   968 (46.1%)    899 (41.2%)
    Female       1230 (60.2%)  1132 (53.9%)  1283 (58.8%)
Body mass index 30.3 (3.96)    29.7 (3.77)    29.9 (3.71)   <0.001
_____________________________________________________________________
```

Plotting variables

- Continuous univariate

```
descr <- compareGroups(group ~ ., predimed)
plot(descr['bmi'])
```

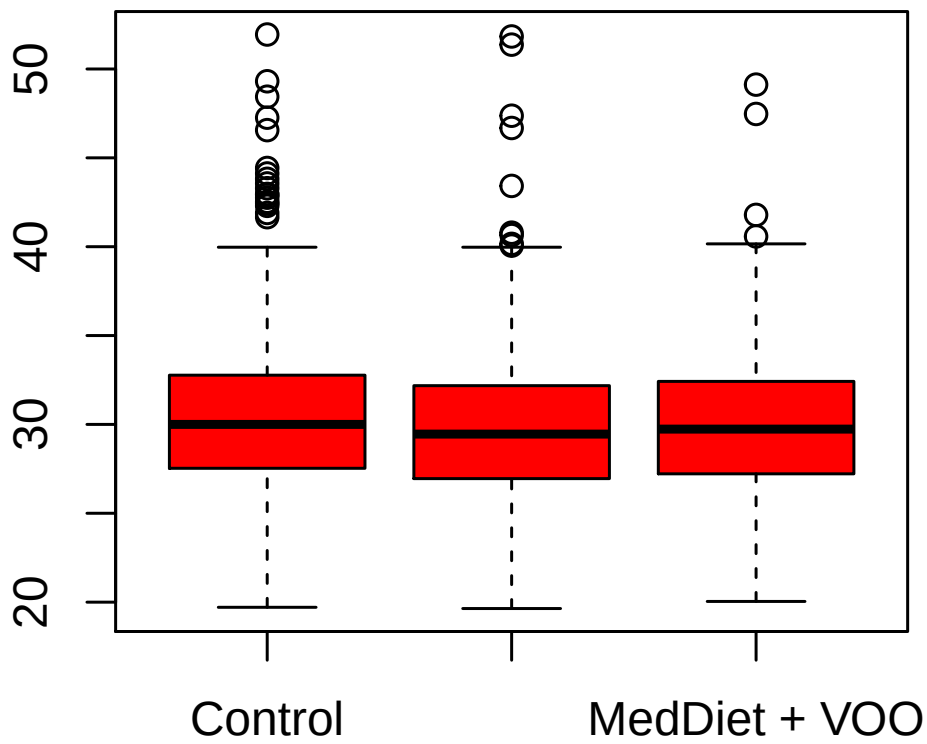
Normality plots of 'Body mass index'



- Continuous by groups

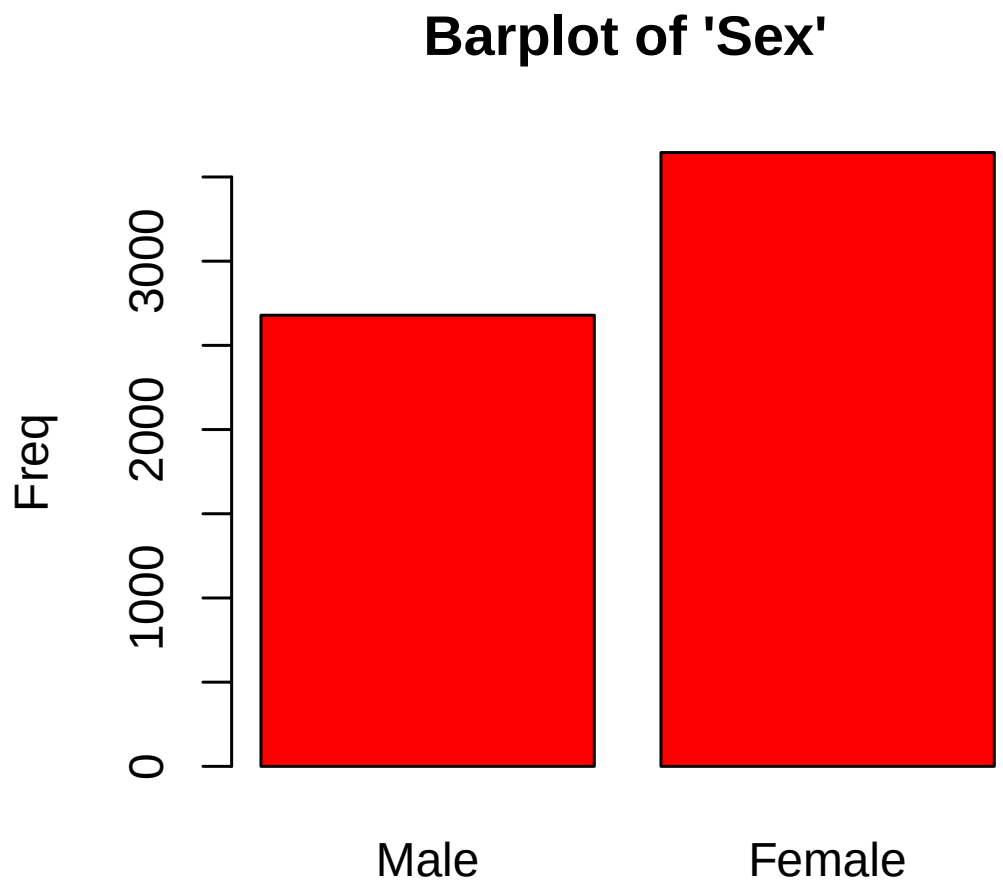
```
plot(descr['bmi'], bivar=TRUE)
```

xplot of 'Body mass index' by 'Intervention



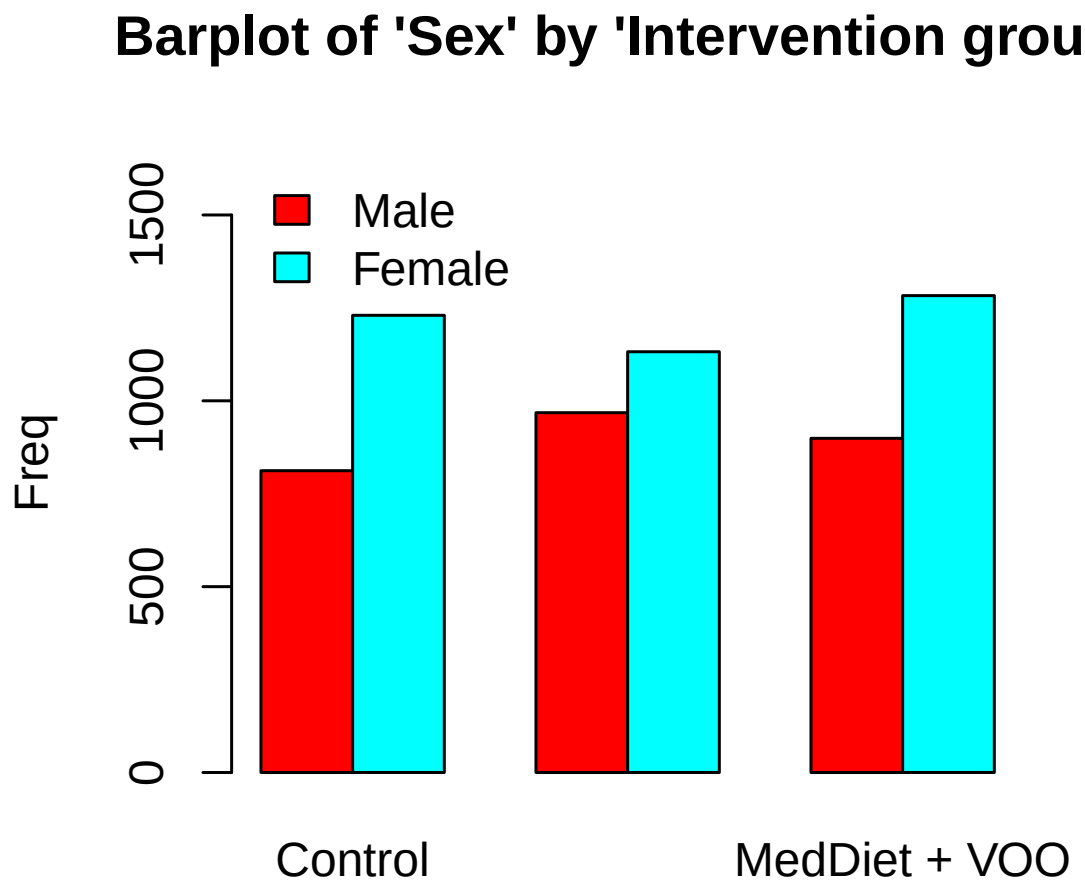
- Categorical variable

```
plot(descr['sex'])
```



- Categorical by groups

```
plot(descr['sex'], bivar=TRUE)
```



Export

```
# CSV
export2csv(descrtable, file="tabla.csv", sep=";")
# Excel
export2xls(descrtable, file="tabla.xlsx")
# Word
export2word(descrtable, file="tabla.docx")
# Latex
export2tex(descrtable, file="tabla.tex")
```

. . . or inside a **Rmarkdown** document chunk

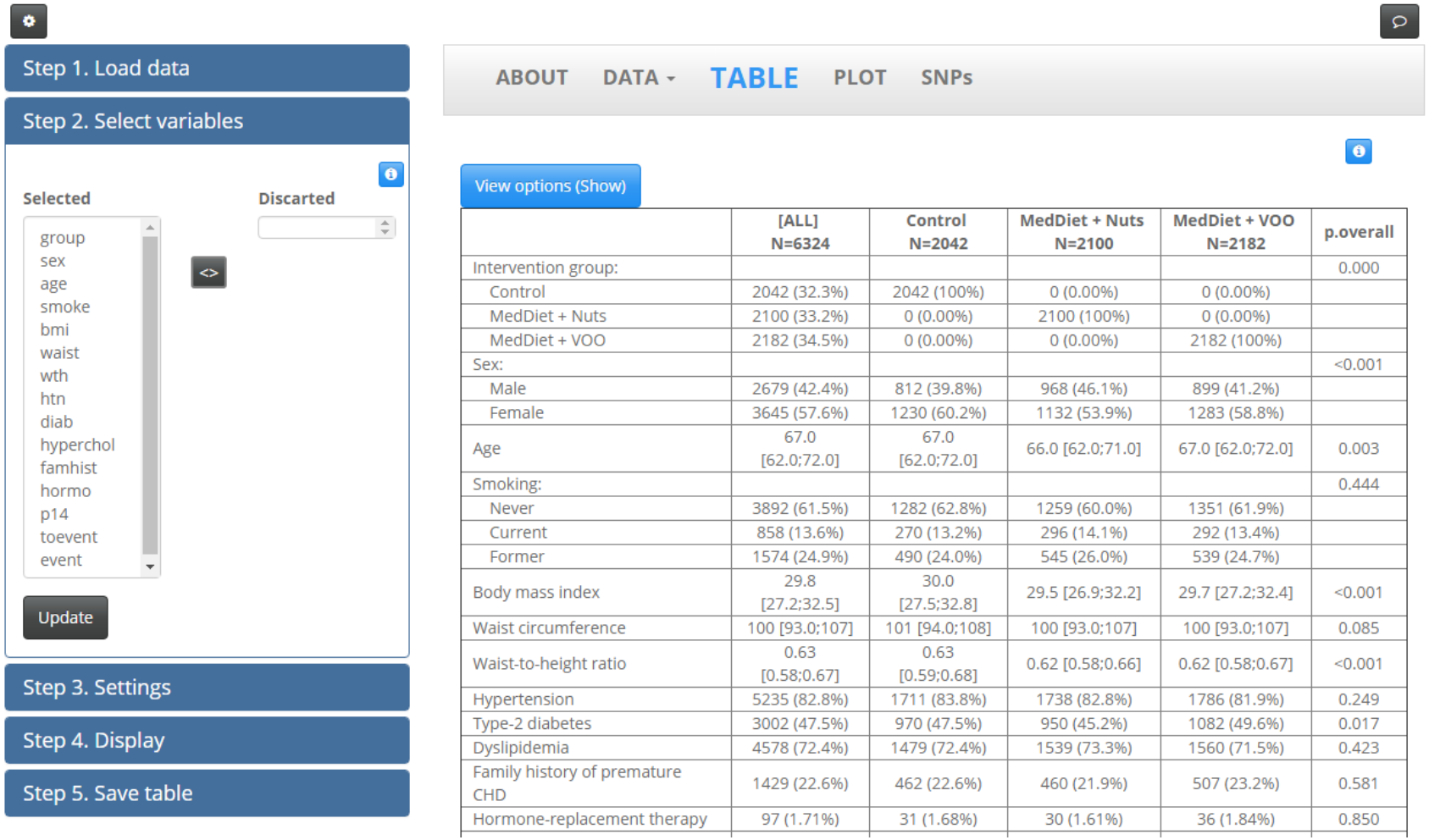
```
export2md(descrtable)
```

Table 1: Summary descriptives table by groups o

	Control N=2042	MedDiet + Nuts
Sex:		
Male	812 (39.8%)	968 (46.1%
Female	1230 (60.2%)	1132 (53.9%
Age of participant	67.3 (6.28)	66.7 (6.02

More

- There exists much more options
- See `?compareGroups`, `?createTable`, ...
- Visit compareGroups wepage
- Application made with Shiny available here



	[ALL] N=6324	Control N=2042	MedDiet + Nuts N=2100	MedDiet + VOO N=2182	p.overall
Intervention group:					0.000
Control	2042 (32.3%)	2042 (100%)	0 (0.00%)	0 (0.00%)	
MedDiet + Nuts	2100 (33.2%)	0 (0.00%)	2100 (100%)	0 (0.00%)	
MedDiet + VOO	2182 (34.5%)	0 (0.00%)	0 (0.00%)	2182 (100%)	
Sex:					<0.001
Male	2679 (42.4%)	812 (39.8%)	968 (46.1%)	899 (41.2%)	
Female	3645 (57.6%)	1230 (60.2%)	1132 (53.9%)	1283 (58.8%)	
Age	67.0 [62.0;72.0]	67.0 [62.0;72.0]	66.0 [62.0;71.0]	67.0 [62.0;72.0]	0.003
Smoking:					0.444
Never	3892 (61.5%)	1282 (62.8%)	1259 (60.0%)	1351 (61.9%)	
Current	858 (13.6%)	270 (13.2%)	296 (14.1%)	292 (13.4%)	
Former	1574 (24.9%)	490 (24.0%)	545 (26.0%)	539 (24.7%)	
Body mass index	29.8 [27.2;32.5]	30.0 [27.5;32.8]	29.5 [26.9;32.2]	29.7 [27.2;32.4]	<0.001
Waist circumference	100 [93.0;107]	101 [94.0;108]	100 [93.0;107]	100 [93.0;107]	0.085
Waist-to-height ratio	0.63 [0.58;0.67]	0.63 [0.59;0.68]	0.62 [0.58;0.66]	0.62 [0.58;0.67]	<0.001
Hypertension	5235 (82.8%)	1711 (83.8%)	1738 (82.8%)	1786 (81.9%)	0.249
Type-2 diabetes	3002 (47.5%)	970 (47.5%)	950 (45.2%)	1082 (49.6%)	0.017
Dyslipidemia	4578 (72.4%)	1479 (72.4%)	1539 (73.3%)	1560 (71.5%)	0.423
Family history of premature CHD	1429 (22.6%)	462 (22.6%)	460 (21.9%)	507 (23.2%)	0.581
Hormone-replacement therapy	97 (1.71%)	31 (1.68%)	30 (1.61%)	36 (1.84%)	0.850

Figure 2: compareGroups Shiny app

Session info

```
sessionInfo()
```

```
R version 3.4.1 (2017-06-30)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 10 x64 (build 16299)

Matrix products: default

locale:
[1] LC_COLLATE=Spanish_Spain.1252  LC_CTYPE=Spanish_Spain.1252
[3] LC_MONETARY=Spanish_Spain.1252 LC_NUMERIC=C
[5] LC_TIME=Spanish_Spain.1252

attached base packages:
[1] parallel  stats     graphics  grDevices utils     datasets  methods
[8] base

other attached packages:
 [1] compareGroups_3.3.1 SNPassoc_1.9-6      mvtnorm_1.0-6
 [4] haplo.stats_1.7.7   xtable_1.8-2        gdata_2.18.0
 [7] Hmisc_4.0-3         ggplot2_2.2.1       Formula_1.2-2
[10] survival_2.41-3     lattice_0.20-35     knitr_1.20

loaded via a namespace (and not attached):
 [1] gtools_3.5.0        zoo_1.8-0           splines_3.4.1
 [4] colorspace_1.3-2    htmltools_0.3.6     yaml_2.1.16
 [7] base64enc_0.1-3     rlang_0.1.6         HardyWeinberg_1.5.8
[10] pillar_1.1.0        foreign_0.8-69      RColorBrewer_1.1-2
[13] multcomp_1.4-7      plyr_1.8.4          stringr_1.3.0
[16] MatrixModels_0.4-1  munsell_0.4.3       gtable_0.2.0
[19] htmlwidgets_0.9     codetools_0.2-15    evaluate_0.10.1
```