

B.I.R.O. Central Engine

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What's this?

The Central Engine is a set of R functions, that combined together, provides a tool to analyze the central BIRO database

What can the CE do?

- a PDF report
 - HTML table
- JPEG, PDF, PNG, SVG graphics

The SE and CE: “two brothers”

- They have the same architecture
- The functions have similar names
- They share the lib directories
- Some functions work both local side and central side (trellis, standardization)
- Can be activated/called by a function:
BIRO_se or BIRO_ce

The architecture

SE and CE have a similar
architecture

(they share the “lib” directory)

Directories:

- Main
- Include
- Formats
- Scripts

How does ti work?

- The core function (engine) is called BIRO_ce_report:

```
BIRO_ce_report(ind="2_2_1_1",
              numclass=4,
              condition="",
              width=1,
              stratum=c("weight_c","type_dm","sex","age_c"),
              lev=list(a=classlabel(weightth),b=as.vector(names(levtype_dm)),c=names(levsex),
                      d=classlabel(ageth)),
              tab=1,
              namevar=c("Weight","Type of Diabetes","Gender","Age (in classes)"),
              tabvarsum=c("Freq"),
              n=c(6,2,2,4),
              bar=1,
              barvarsum=c("Freq","sum"),
              beside=TRUE,
              perc=TRUE,
              lines=1,
              box=1,
              texfile=texfile,
              dirgraph=dirgraph,
              cex=cex)
```

In details

- This function calls other sub-functions:
 - Their aim is to aggregate data (stored in the central DB, each of these get data directly from the DB, instead in the SE there is BIRO_se_datastep)
 - And/or manage the call of the “plotting” functions

Outputs

- Latex2e/HTML tables
- Barplots
- Trends
- Boxplots
- Forest Plots
- Maps
- Simple statistics (mean, var)

What does each SE send?

- A .csv like this:

```
"sex","n","sum","variable","date","centre_id"  
1,1077,87191,"weight",2008-11-13,"mycentre"  
2,922,64591,"weight",2008-11-13,"mycentre"
```

This is the .csv for the mean of the variable weight conditioned to the value of gender (1="Male",2="Female"), mean is done by sum/n .

What does CE do?

The aggregation of data consists of

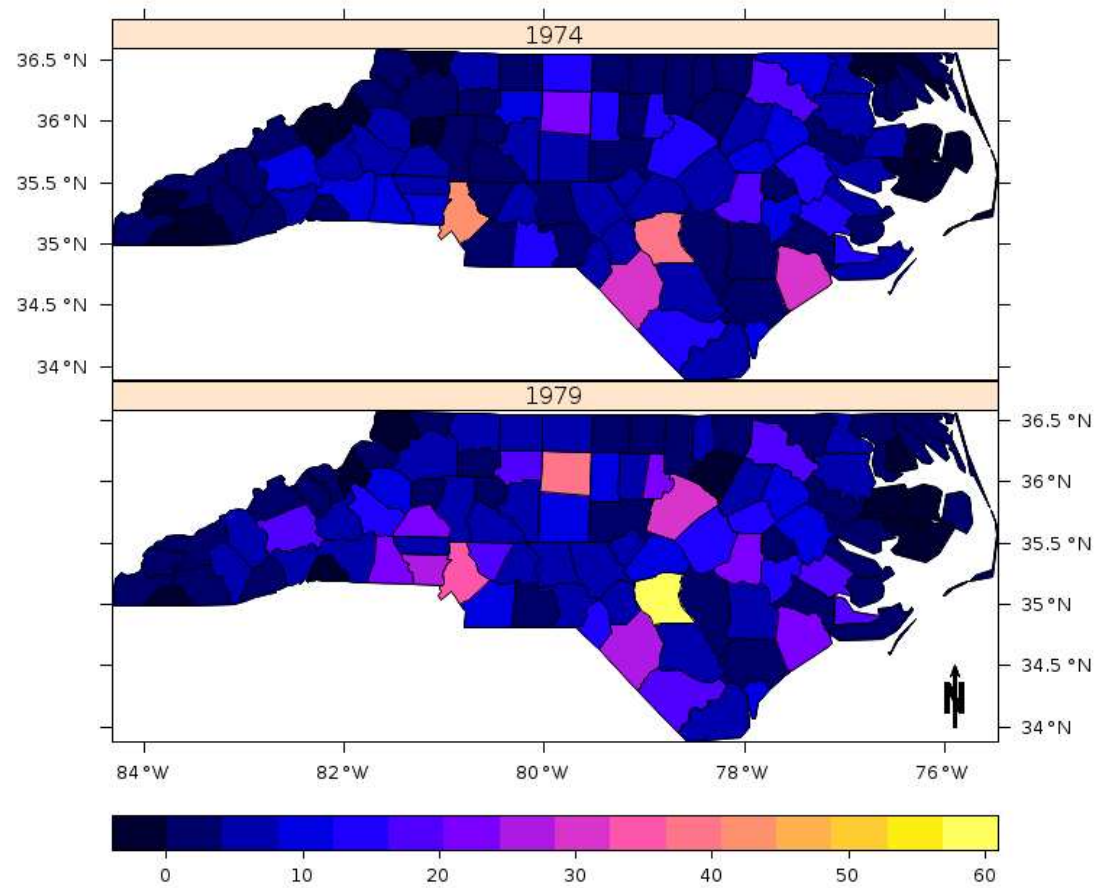
- appending all the data from each centre

```
"sex","n","sum","variable","date","centre_id"  
1,1077,87191,"weight",2008-11-13,"mycentre1"  
2,922,64591,"weight",2008-11-13,"mycentre1"  
1,974,82034,"weight",2008-10-22,"mycentre2"  
2,500,48542,"weight",2008-10-22,"mycentre2"
```

- Summing “sum” and “n” for each category of the stratification variable
- After this: we have only to launch the function that plots data

Maps

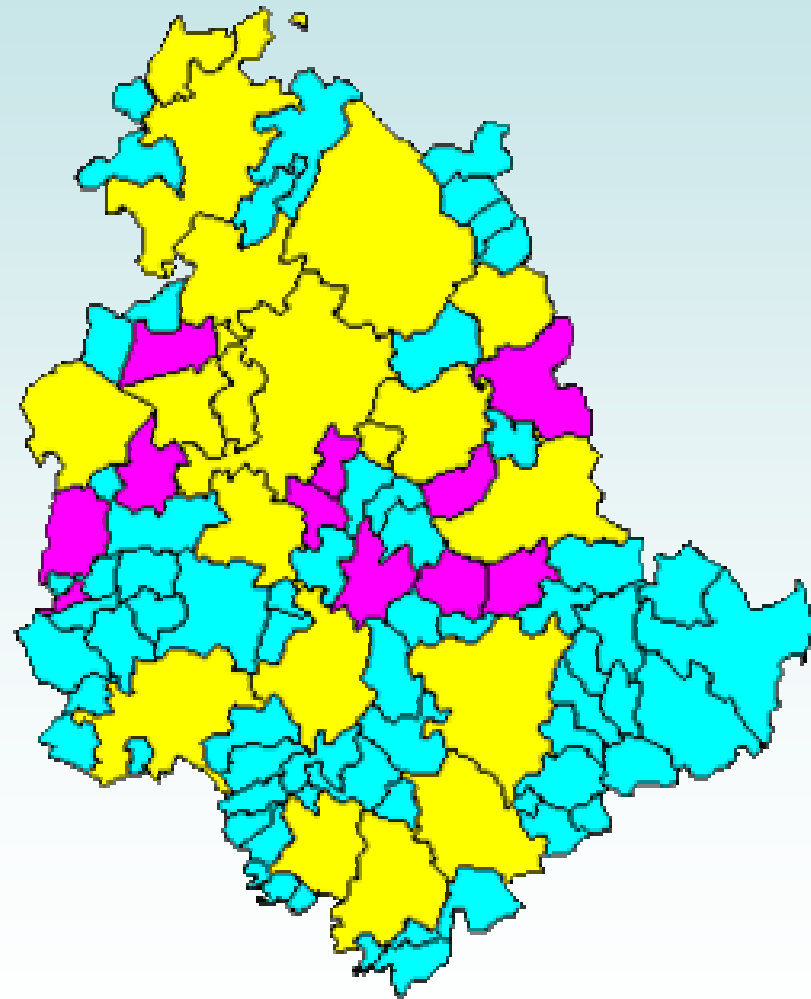
SIDS (sudden infant death syndrome) in North Carolina



Maps 2

- The package maptools (recently improved) creates maps that represent the conditioned geographical distribution of a variable
- We have built a BIRO function, using “spplot” and “readShapePoly”, that reads a shape file, associates data to areas and plots conditioned maps (i.e. type of diabetics)

A choropleth map of Umbrian population



Standardization:

- BIRO_standardize:
 - Areal level (population) indicators
 - Provider level indicators

Using the (logistic) standardization model of AHRQ.

Regression:

- GLM models:
 - Linear models
 - Poisson models
 - Logistic models

Thank you!!!