

VISUAL VIGNETTES

EXAMPLES OF R GRAPHICS IN DEMOGRAPHY

Maja Založnik



OXFORD

12th March 2015

OUTLINE

- Introduction
- Good Practice
- Visualising Categorical Data
- Interactive R graphics
- Creating bespoke graphical solutions
- Borrowing Google Charts

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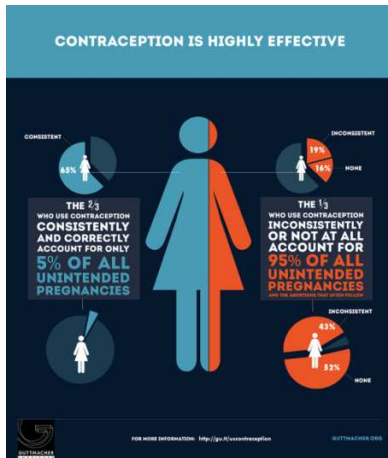
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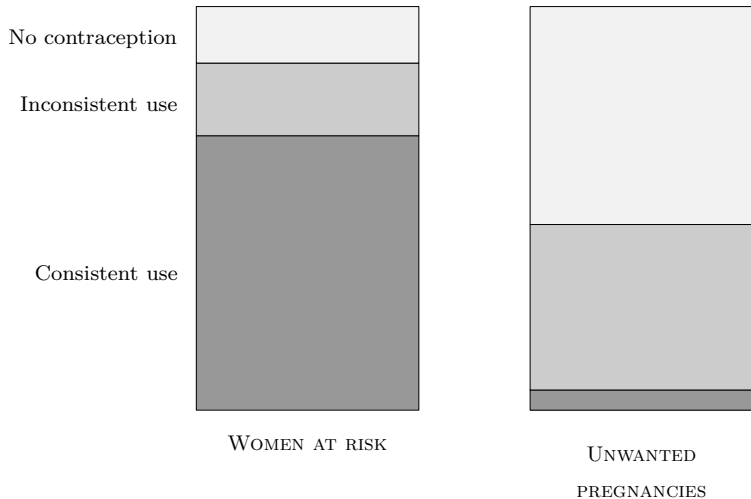
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GOOD PRACTICE!?

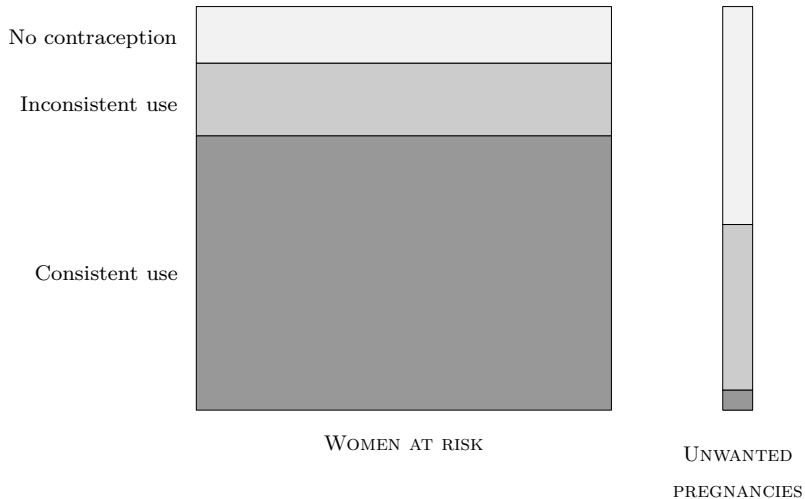


Source: Guttmacher Institute 2013

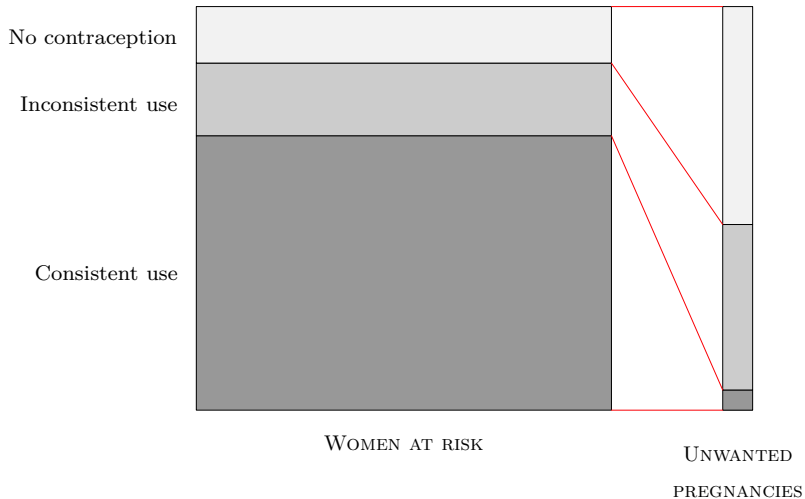
GOOD PRACTICE!?



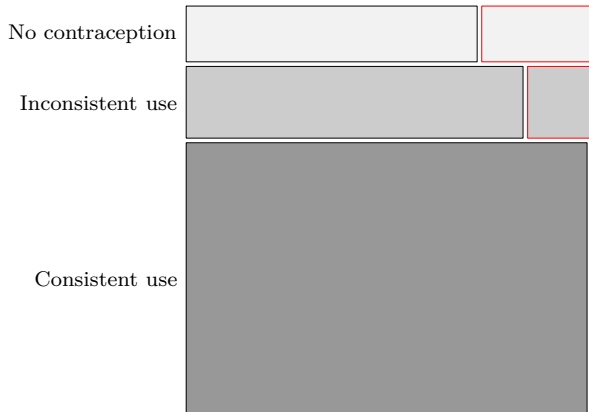
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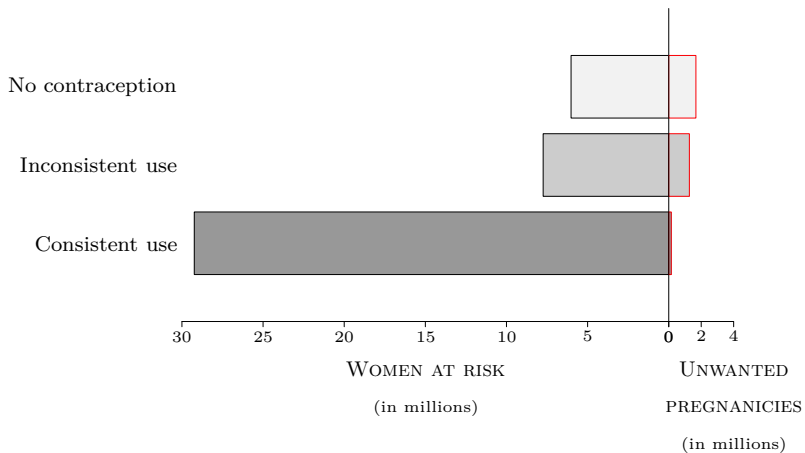
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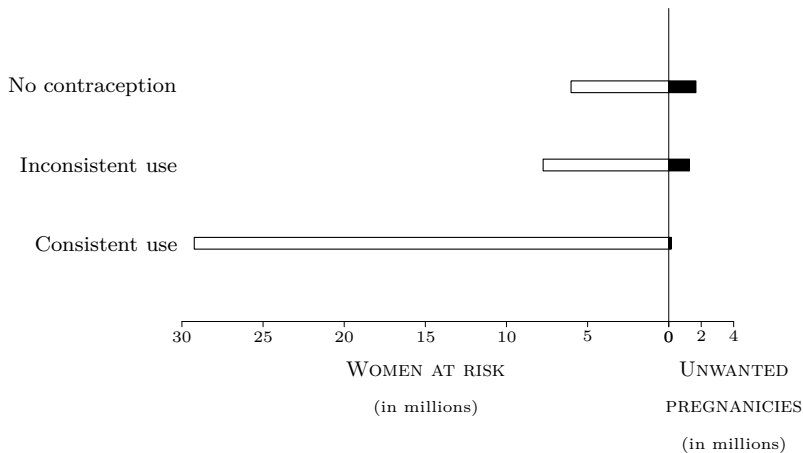
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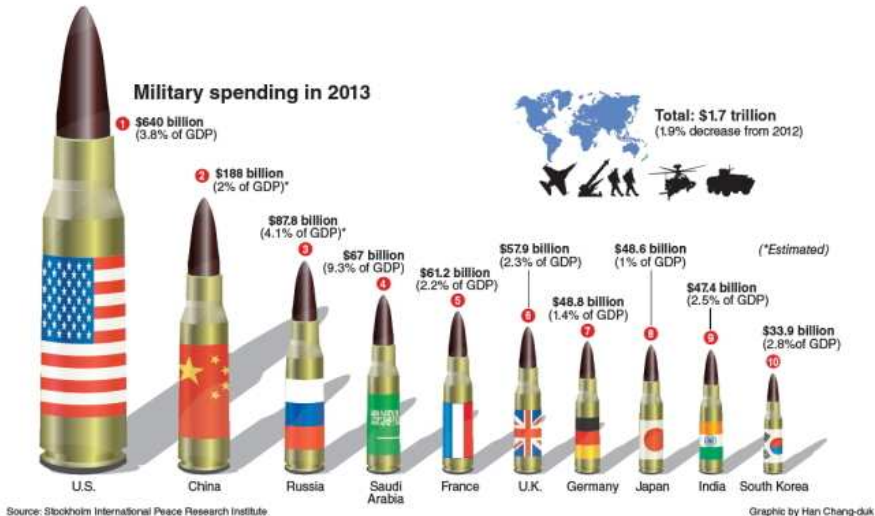
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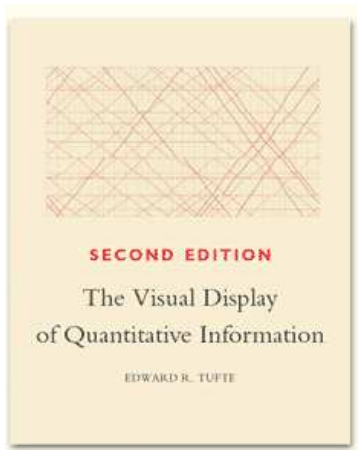


GOOD PRACTICE!?



GOOD PRACTICE

EDWARD TUFTE



GOOD PRACTICE

REPRODUCIBLE RESEARCH

- RStudio
- RStudio server
- git & github
- knitr & Rpubs
- Reproducible Research – *Christopher Gandrud*

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- Reproducible Research – *Christopher Gandrud*
- `##comment or die!`

VISUALISING CATEGORICAL DATA

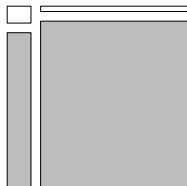
ILLITERACY AND NATIVITY IN US 1930 CENSUS

	<i>Foreign born</i>	<i>Native born</i>	<i>Total</i>
<i>Illiterate</i>	1,306,084	2,557,026	3,863,110
<i>Literate</i>	11,964,722	79,852,667	91,817,389
<i>Total</i>	13,270,806	82,409,693	95,680,499

VISUALISING CATEGORICAL DATA

ILLITERACY AND NATIVITY IN US 1930 CENSUS

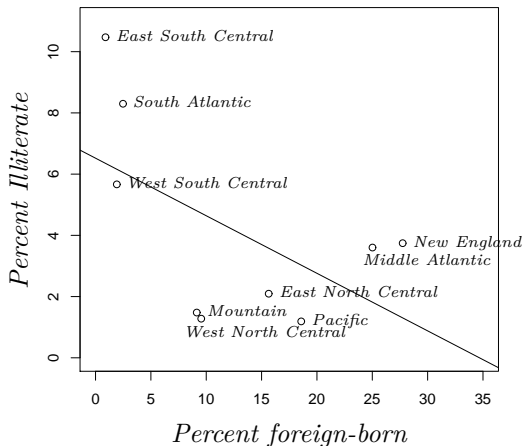
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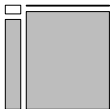
ROBINSON'S REVERSAL OF CORRELATIONS

$$\text{correlation} = -0.567$$



VISUALISING CATEGORICAL DATA

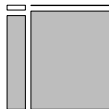
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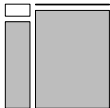
East North Central



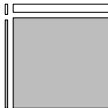
East South Central



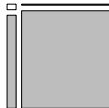
Pacific



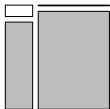
Middle Atlantic



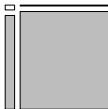
South Atlantic



Mountain



New England



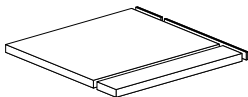
West North Central



West South Central

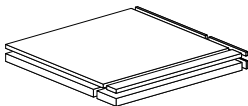
VISUALISING CATEGORICAL DATA

PAINSTAKING



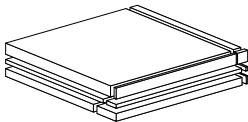
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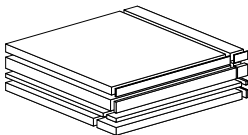
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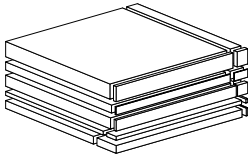
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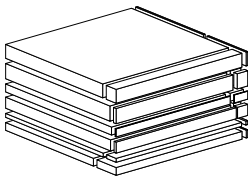
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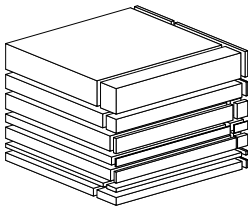
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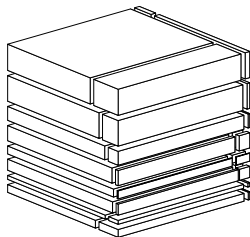
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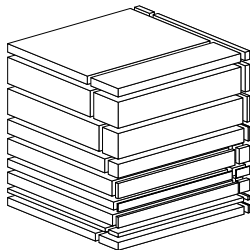
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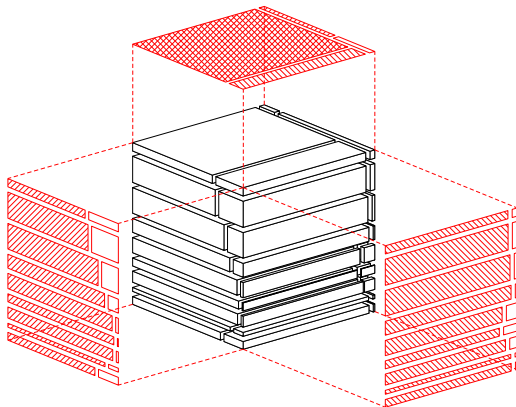
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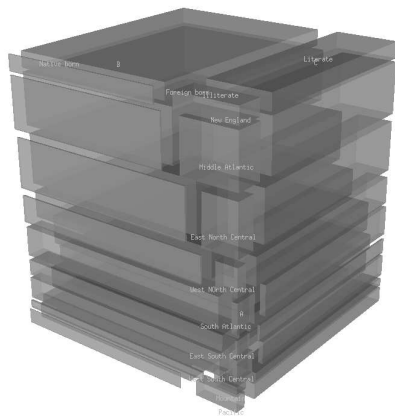
VISUALISING CATEGORICAL DATA

PAINSTAKING



VISUALISING CATEGORICAL DATA

LIBRARY (VDCExtra)



INTERACTIVE GRAPHICS WITH R

SHINY

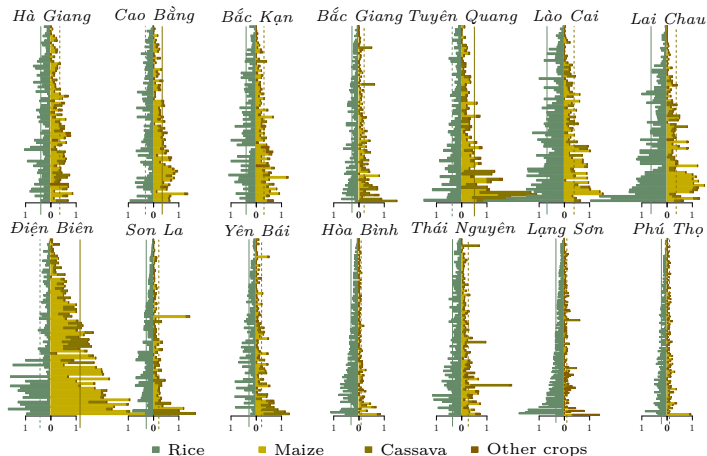
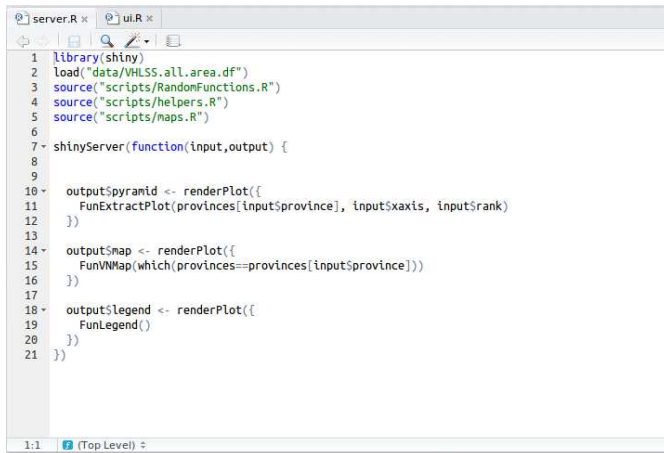


FIGURE: Areas of rice planted (left) and other crops (right) on individual farms for each province (in ha) (data: VHLSS 2012)

INTERACTIVE GRAPHICS WITH R

SHINY - SERVER.R

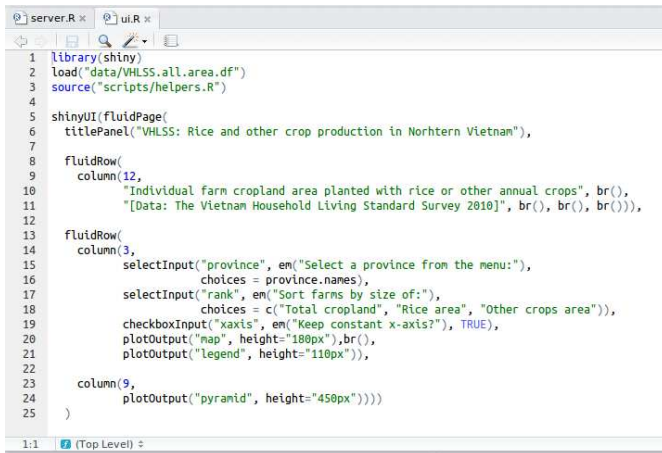


```
1 library(shiny)
2 load("data/VHLSS.all.area.df")
3 source("scripts/RandomFunctions.R")
4 source("scripts/helpers.R")
5 source("scripts/maps.R")
6
7 shinyServer(function(input,output) {
8
9
10  output$pyramid <- renderPlot({
11    FunExtractPlot(provinces[input$province], input$xaxis, input$rank)
12  })
13
14  output$map <- renderPlot({
15    FunVMap(which(provinces==provinces[input$province]))
16  })
17
18  output$legend <- renderPlot({
19    FunLegend()
20  })
21 })
```

FIGURE: Content of `server.R` file for VHLSS shiny app

INTERACTIVE GRAPHICS WITH R

SHINY - UI.R



```
1 library(shiny)
2 load("data/VHLSS.all.area.df")
3 source("scripts/helpers.R")
4
5 shinyUI(fluidPage(
6   titlePanel("VHLSS: Rice and other crop production in Northern Vietnam"),
7
8   fluidRow(
9     column(12,
10      "Individual farm cropland area planted with rice or other annual crops", br(),
11      "[Data: The Vietnam Household Living Standard Survey 2010]", br(), br(), br()),
12
13     fluidRow(
14       column(3,
15         selectInput("province", em("Select a province from the menu:"),
16           choices = province.names),
17         selectInput("rank", em("Sort farms by size of:"),
18           choices = c("Total cropland", "Rice area", "Other crops area")),
19         checkboxInput("xaxis", em("Keep constant x-axis?"), TRUE),
20         plotOutput("map", height="180px"), br(),
21         plotOutput("legend", height="110px")),
22
23       column(9,
24         plotOutput("pyramid", height="450px"))))
25 )
```

1:1 (Top Level) ↕

FIGURE: Content of ui.R file for VHLSS shiny app

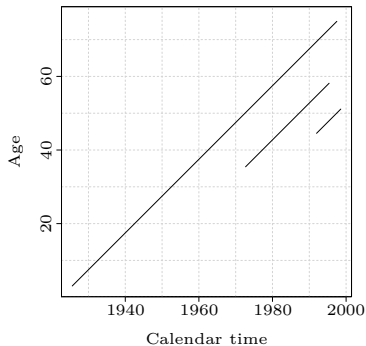
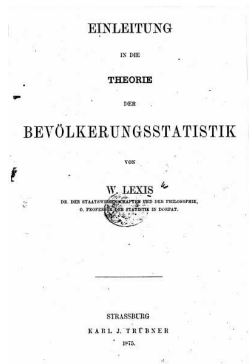
INTERACTIVE GRAPHICS WITH R

SHINY & SHINYAPPS

- Tutorials, examples, documentation etc:
 - <http://shiny.rstudio.com/>
- Online hosting of shiny apps (up to 5 for free):
 - <https://www.shinyapps.io/>

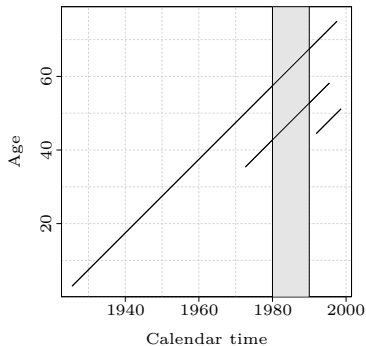
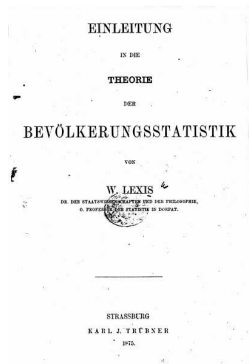
CREATING BESPOKE GRAPHICAL SOLUTIONS

LEXIS DIAGRAMS



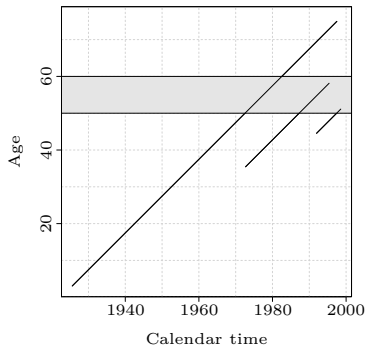
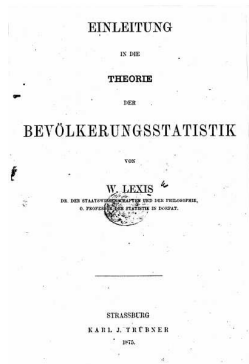
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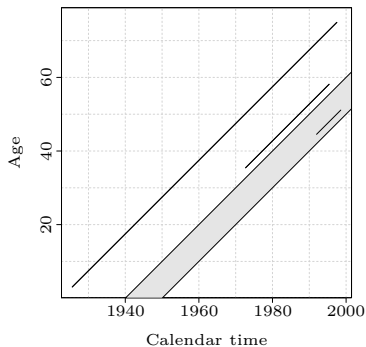
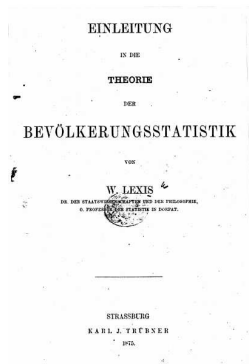
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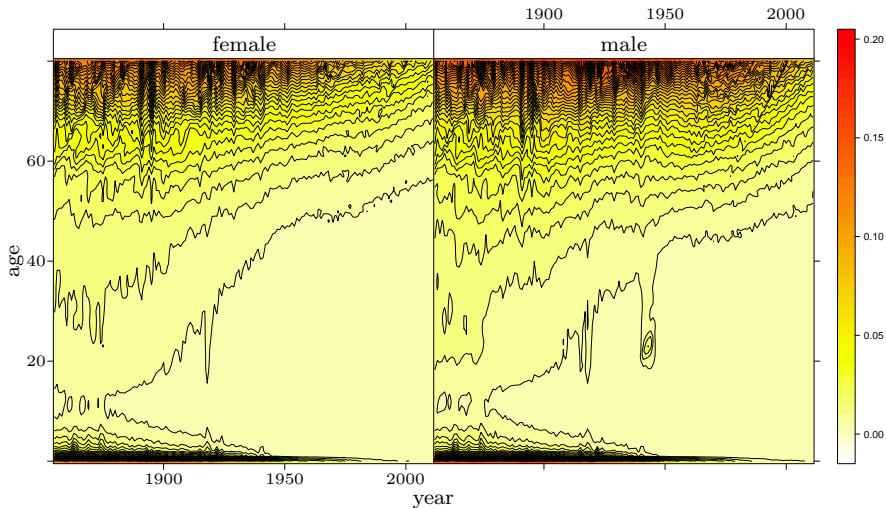
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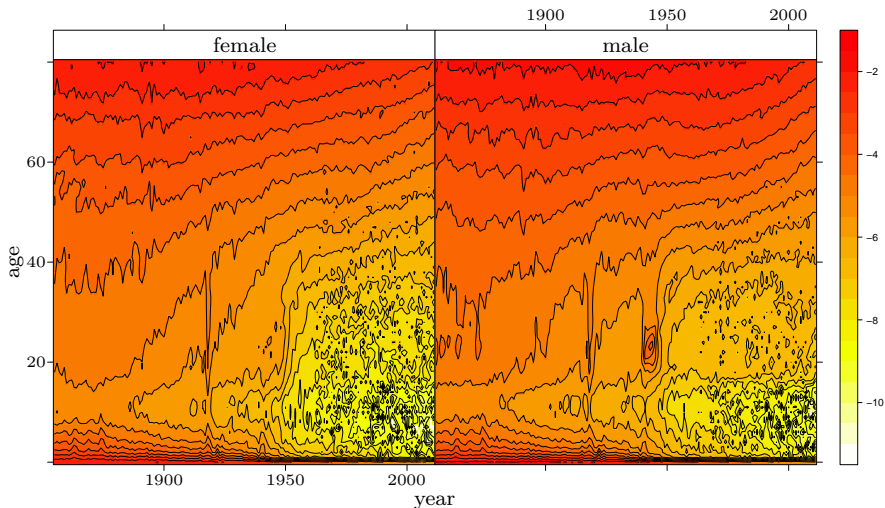
CREATING BESPOKE GRAPHICAL SOLUTIONS

LEXIS MAPS - DEATH RATES IN SCOTLAND 1888 - 2011



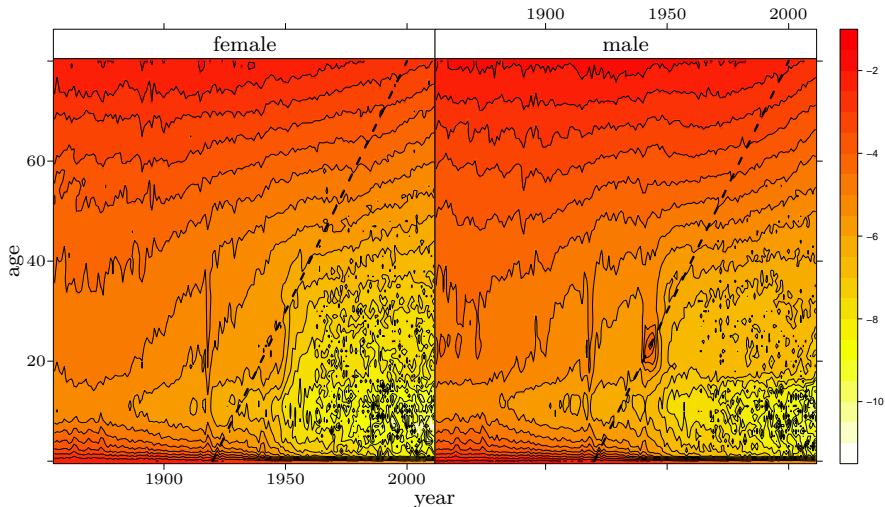
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LEXIS MAPS - LOGGED DEATH RATES IN SCOTLAND 1888 - 2011



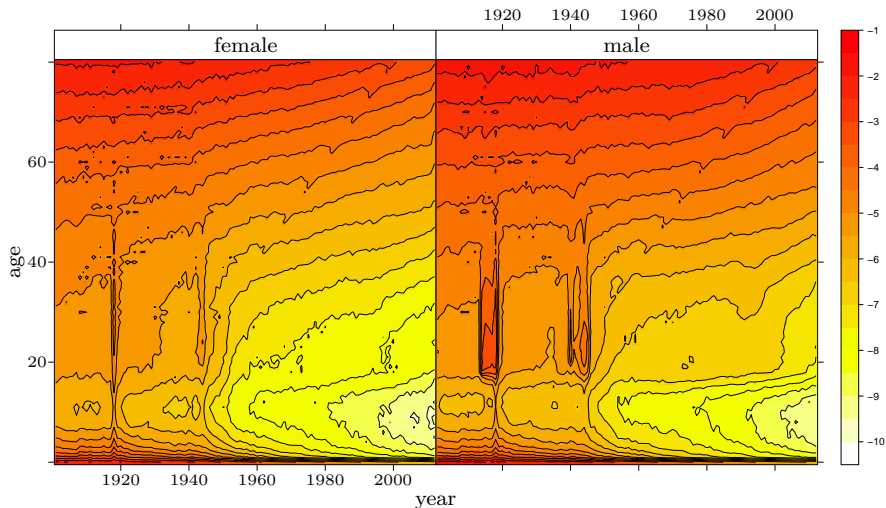
CREATING BESPOKE GRAPHICAL SOLUTIONS

LEXIS MAPS - LOGGED DEATH RATES IN SCOTLAND 1888 - 2011



CREATING BESPOKE GRAPHICAL SOLUTIONS

LEXIS MAPS - LOGGED DEATH RATES 14 EUROPEAN COUNTRIES 1900 ->



CREATING BESPOKE GRAPHICAL SOLUTIONS

HUNTING DEMOGRAPHIC GHOSTS

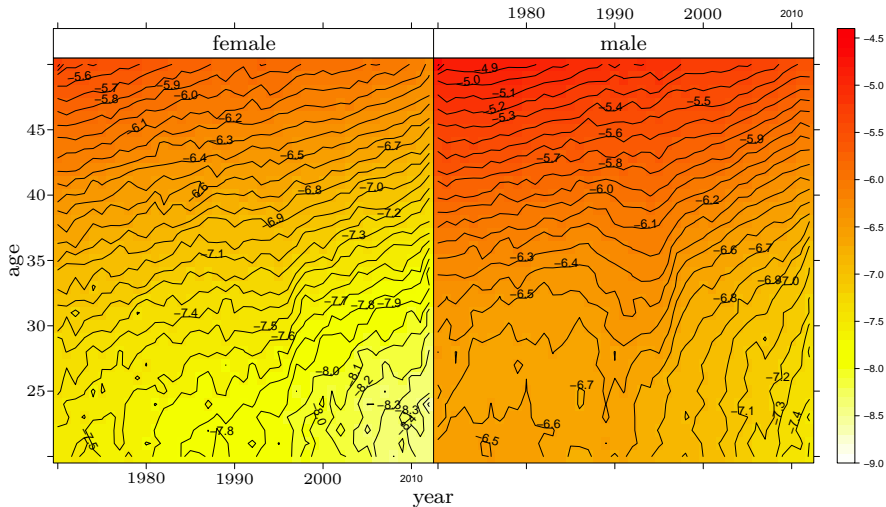


FIGURE: Logged death rate for 14 EU countries 1970 to 2011

VISUAL VIGNETTES

CREATING BESPOKE GRAPHICAL SOLUTIONS

HUNTING DEMOGRAPHIC GHOSTS

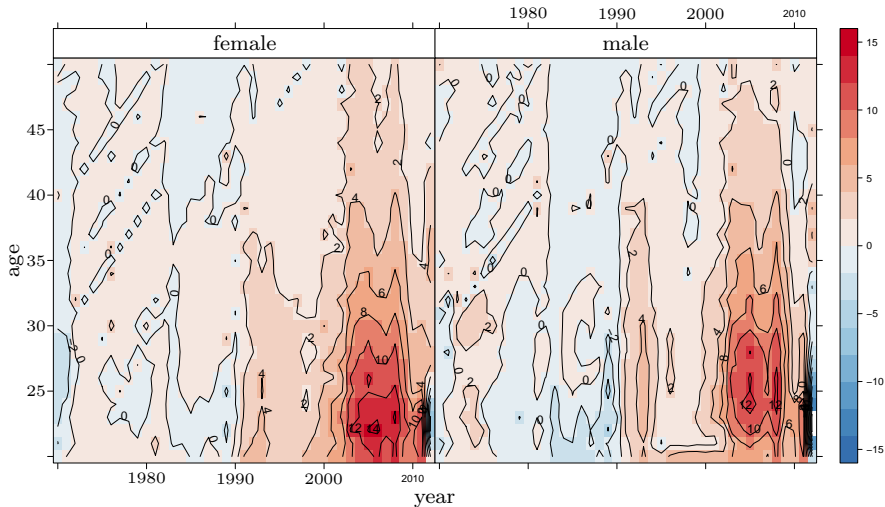


FIGURE: Possible proportional count error (per 1000) for 14 EU countries 1970 to 2011

CREATING BESPOKE GRAPHICAL SOLUTIONS

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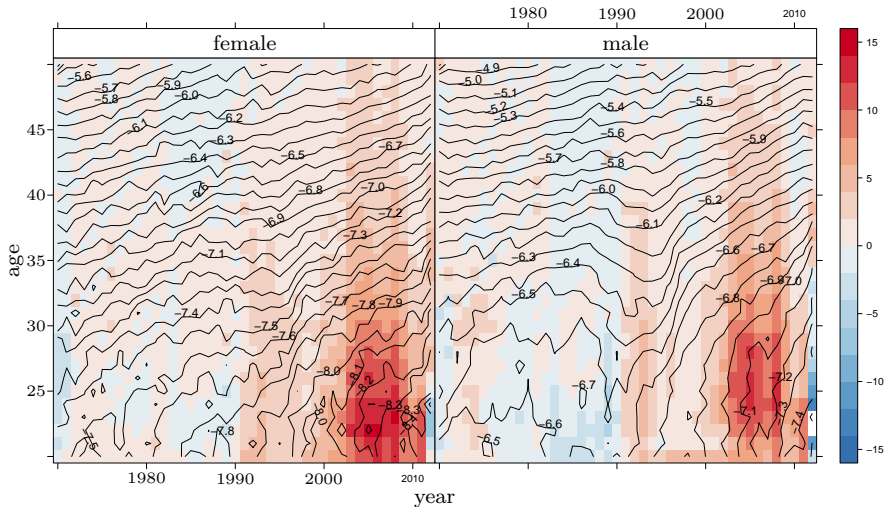


FIGURE:
VISUAL VIGNETTES

CREATING BESPOKE GRAPHICAL SOLUTIONS

3D BATHTUBS

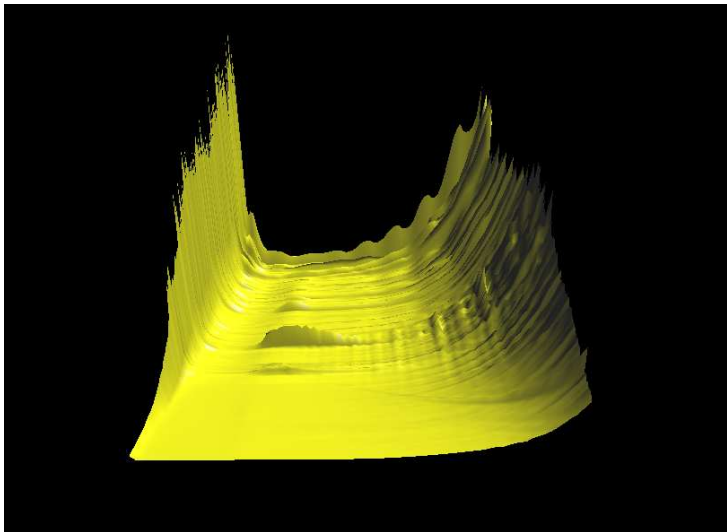


FIGURE: rgl renderring of Lexis surface

VISUAL VIGNETTES

CREATING BESPOKE GRAPHICAL SOLUTIONS

VISUALISING SPATIAL AUTOCORRELATION - LISA MAPS

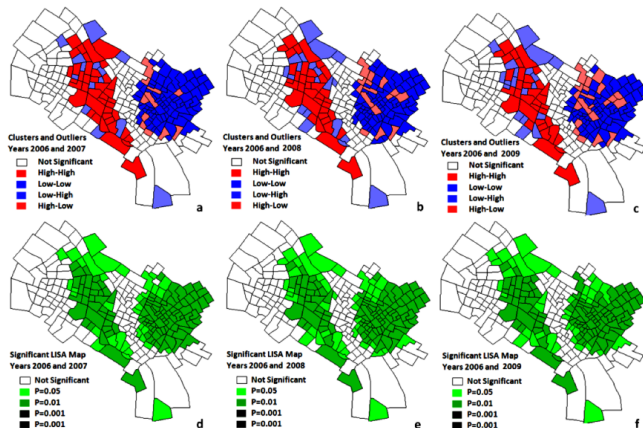
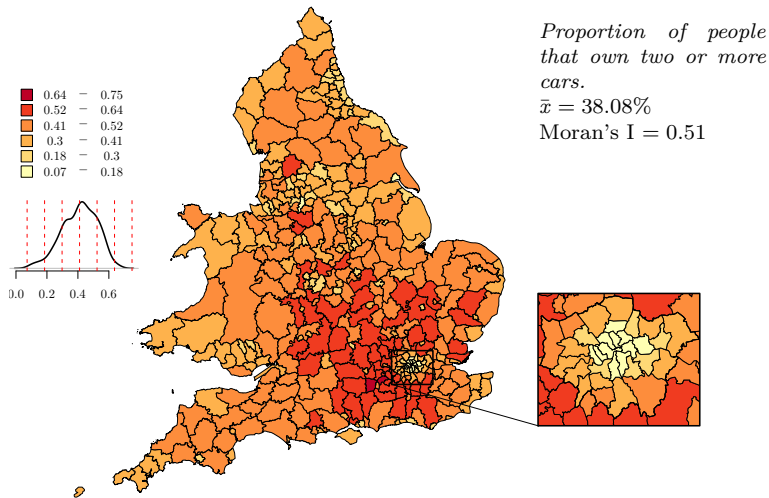


FIGURE: Standard example of LISA map - autocorrelation of car crashes in Mashhad, Iran (from Matkan et al (2013)

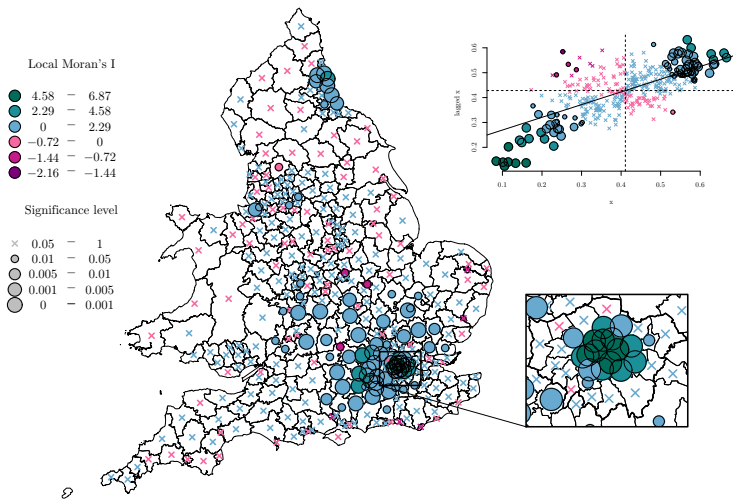
CREATING BESPOKE GRAPHICAL SOLUTIONS

VISUALISING SPATIAL AUTOCORRELATION - LISA MAPS



CREATING BESPOKE GRAPHICAL SOLUTIONS

VISUALISING SPATIAL AUTOCORRELATION - LISA MAPS



BORROWING GOOGLE CHARTS

- Hans Rosling

THE END

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