

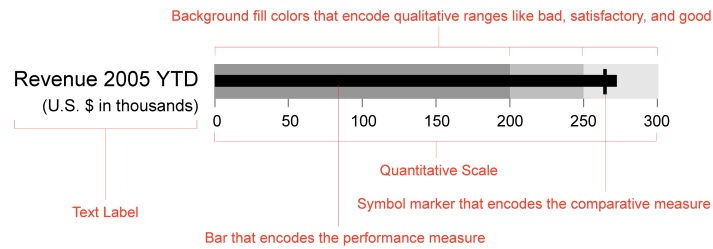
# Data Visualization – More Lab Fun

Data Science Summer School, July 15<sup>th</sup> 2021

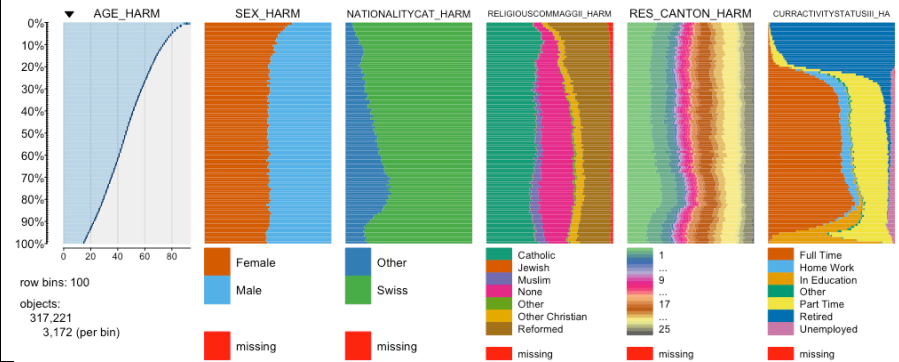
Richard Traunmüller, University of Mannheim

## More Lab

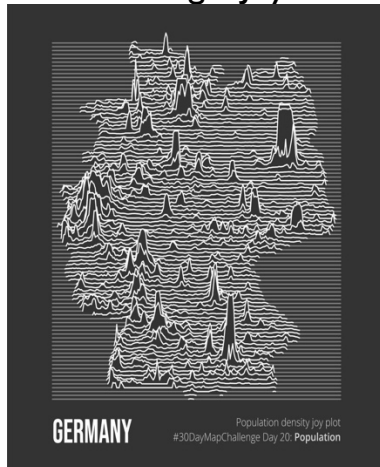
### Constructing a Bullet Graph in R



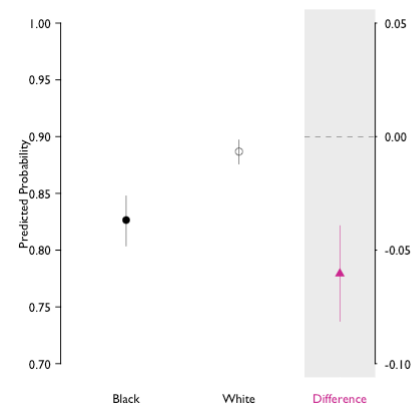
### Exploring Data using Table Plots in R



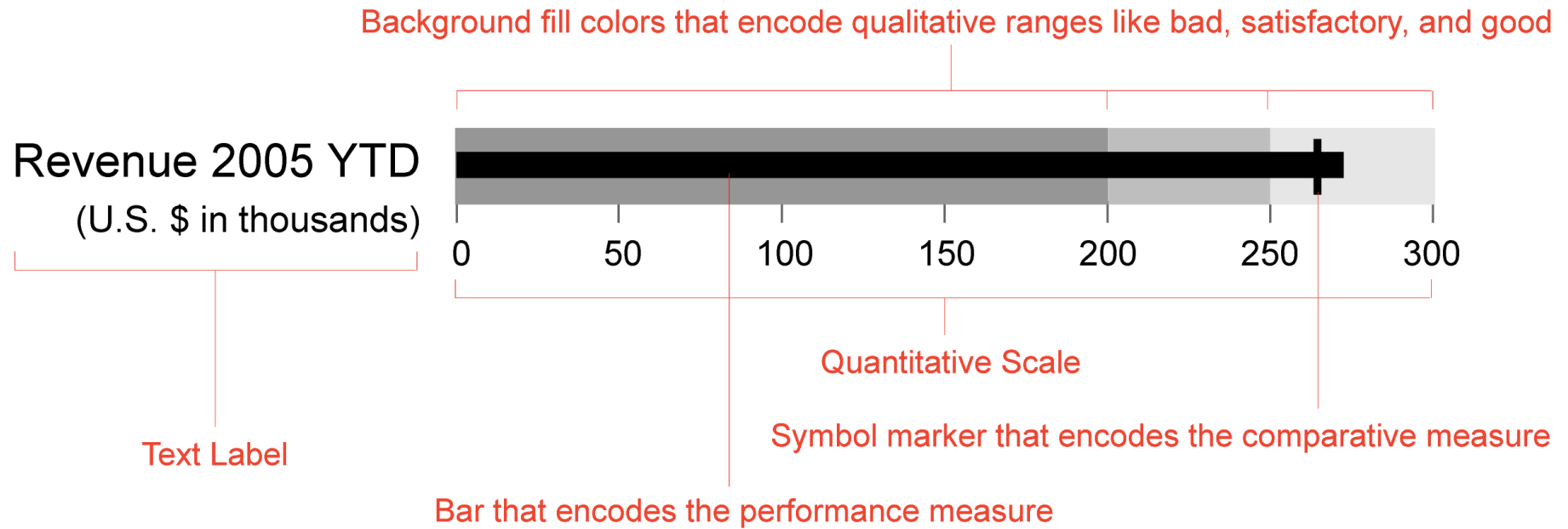
### Constructing a Joy Plot Map in R



### Visualizing Statistical Models in R



## How Do I Construct A Bullet Graph Using R?



## How Do I Construct A Bullet Graph Using R?

Let's think about it:

1. You need one or several **bars**
2. You need background **color areas** for a qualitative judgment
3. You need an additional **plot symbol** for the comparative measure
4. And a **scale** and **label** of course.

All of these ingredients can be easily built in R.

## How Do I Construct A Bullet Graph Using R?

Let's first start with just one bar.

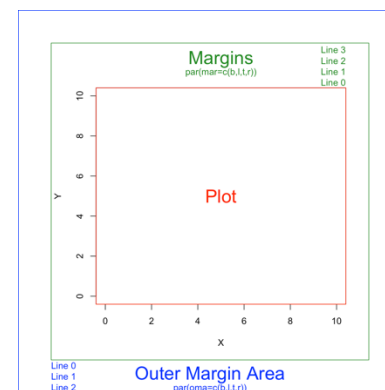
```
measure <- 7
standard <- 6.8

par(mar=c(3,8,2,2), oma=c(13, 1, 13, 1), yaxs="i")

plot(0, 0, xlim=c(0, 10), ylim=c(.45, .55), pch="", ann=F, axes=F)

axis(1)
```

This will just set up an empty plot region and the scale.



How Do I Construct A Bullet Graph Using R?



## How Do I Construct A Bullet Graph Using R?

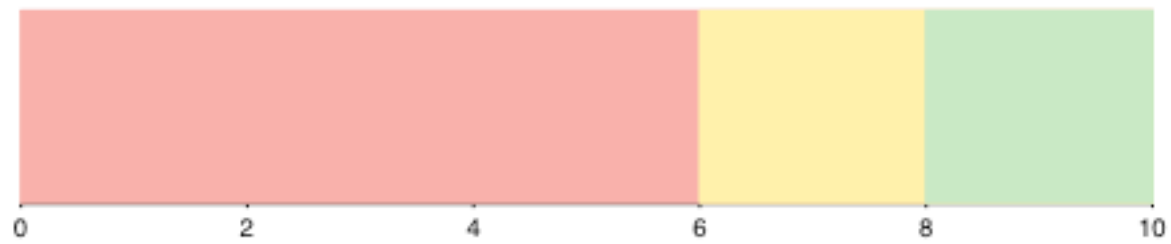
Now let's first add the qualitative color regions.

```
rect(0, .45, 10, .55, col="red", border="red")
```

```
rect(6, .45, 10, .55, col="yellow", border="yellow")
```

```
rect(8, .45, 10, .55, col="green", border="green")
```

How Do I Construct A Bullet Graph Using R?





## How Do I Construct A Bullet Graph Using R?

Now add the bar

```
segments(0, .5, measure, .5, lwd=20, lend=1)
```

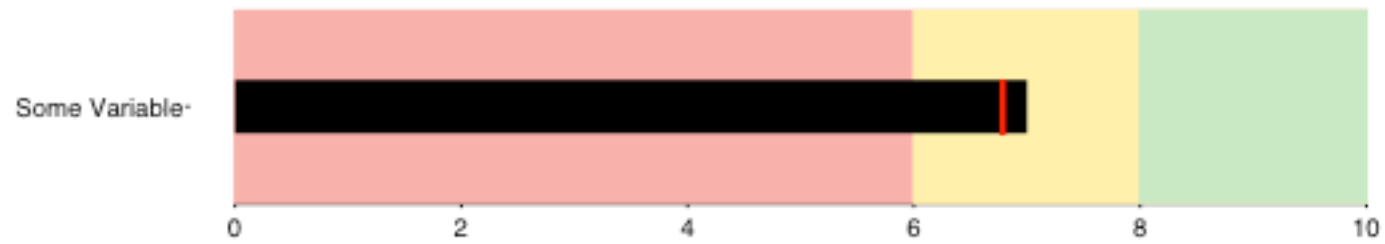
the comparative marker

```
points(standard, .5, pch="|", col="red", cex=3, lwd=10)
```

and the label

```
axis(2, at=.5, label="Some Variable")
```

## How Do I Construct A Bullet Graph Using R?



## How Do I Construct A Bullet Graph Using R?

Now let's do multiple bars!

```
dat <- c(27, 34, 22, 7)

par(mar=c(3,8,2,3), oma=c(4, 1, 4, 1), yaxs="i")

p <- barplot(dat, horiz=T, space=4, border=F, col="black", ylim=c(0, 22),
xlim=c(0, 40), axes=F)

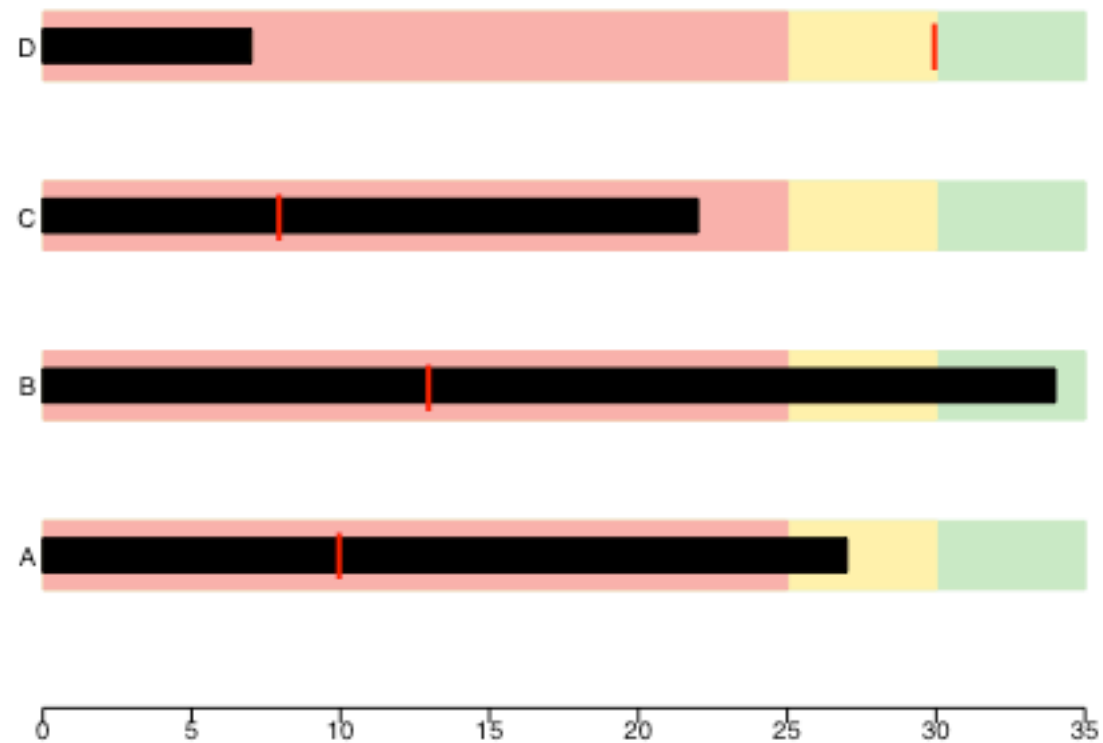
for(i in 1:4){
  rect(0, p[i]-1, 35, p[i]+1, col="red", border="red")
  rect(0, p[i]-1, 30, p[i]+1, col="yellow", border="yellow")
  rect(0, p[i]-1, 25, p[i]+1, col="green", border="green")
}

barplot(dat, horiz=T, space=4, border="black", col="black", ylim=c(0, 22),
axes=F, add=T, names.arg=c("A", "B", "C", "D"))

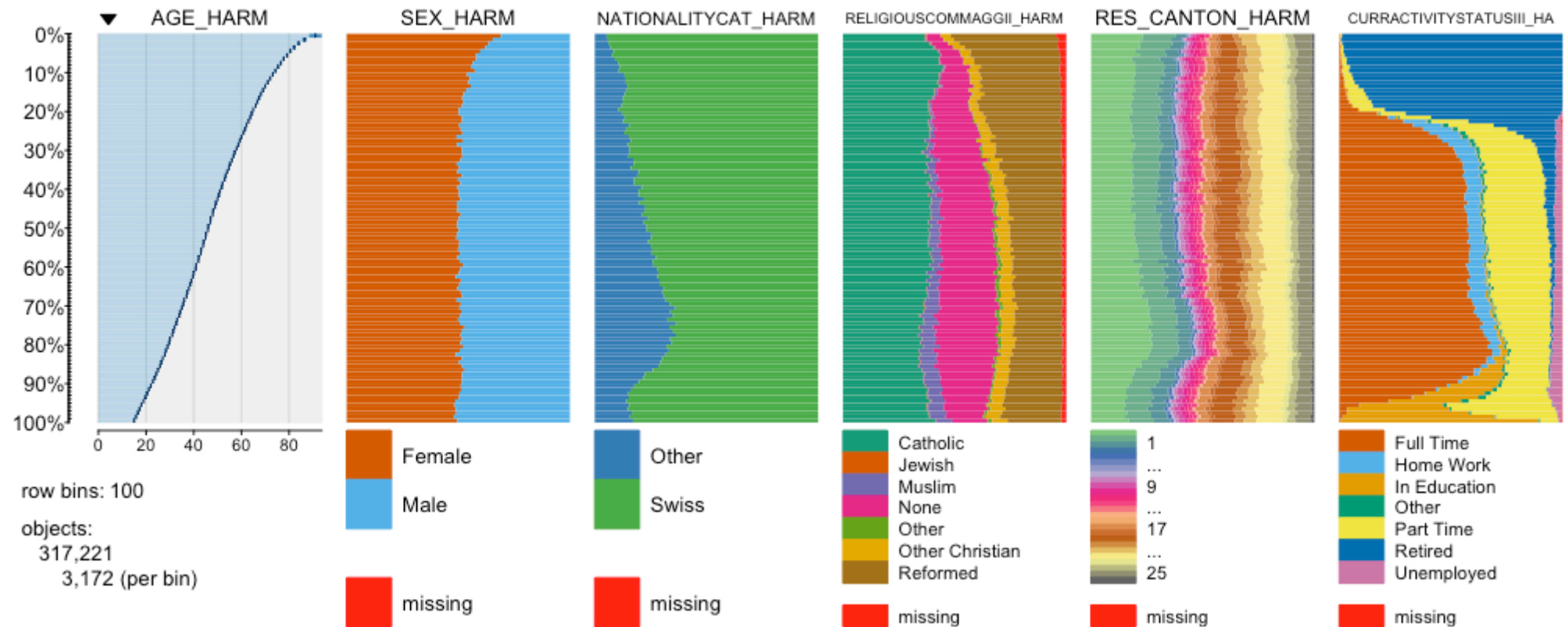
points(c(10, 13, 8, 30), p, pch="|", cex=2.5, lwd=8, col="red")

axis(1, at=seq(0, 35, 5), label=seq(0, 35, 5))
```

## How Do I Construct A Bullet Graph Using R?

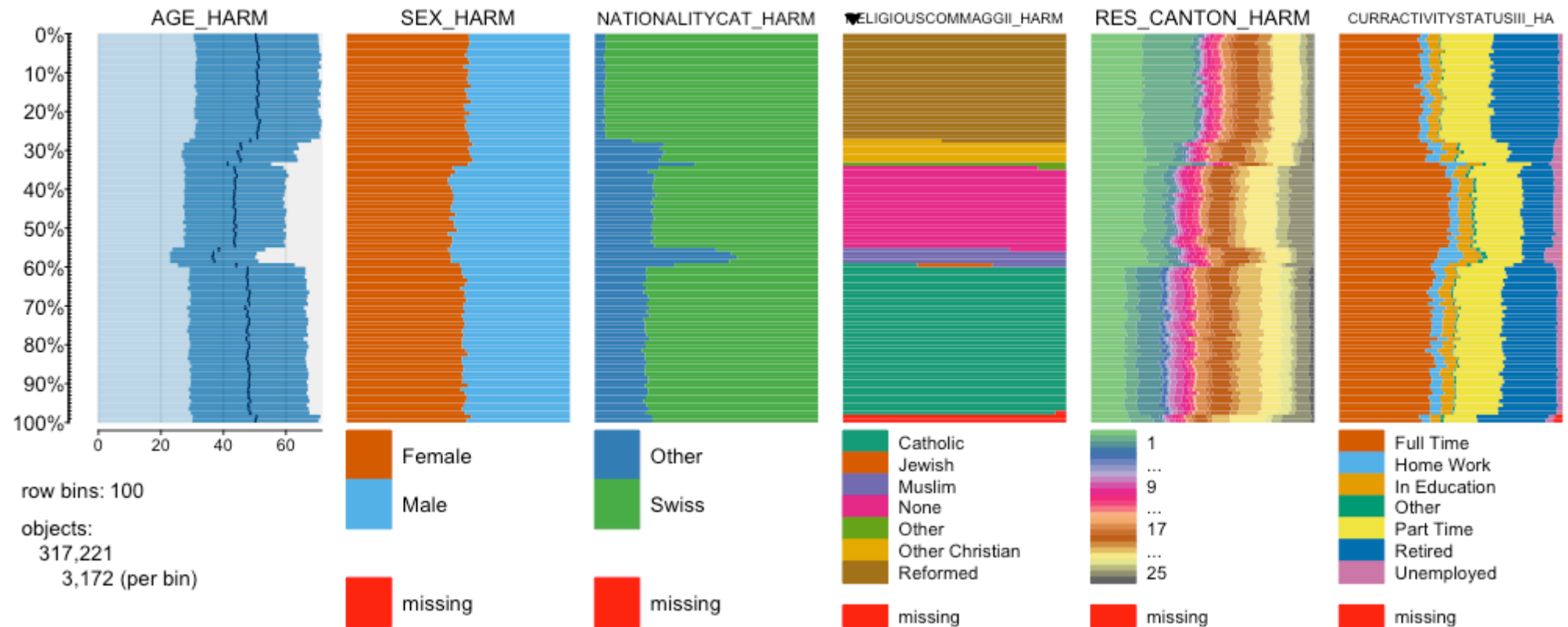


## Exploratory Visualization Using Table Plots



```
library(tabplot)
tableplot(data, sortCol=AGE_HARM)
```

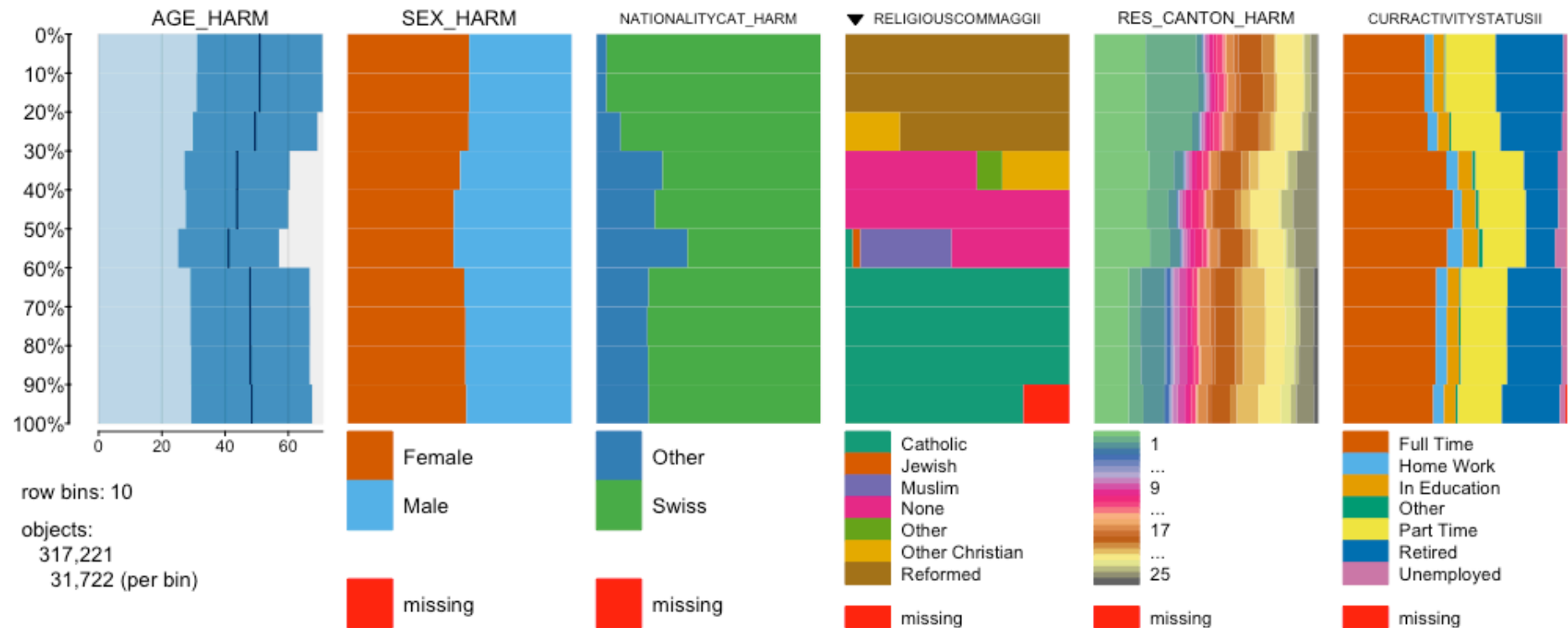
## Exploratory Visualization Using Table Plots



Sort by religious group

```
tableplot(data, sortCol=RELIGIOUSCOMMAGGII_HARM)
```

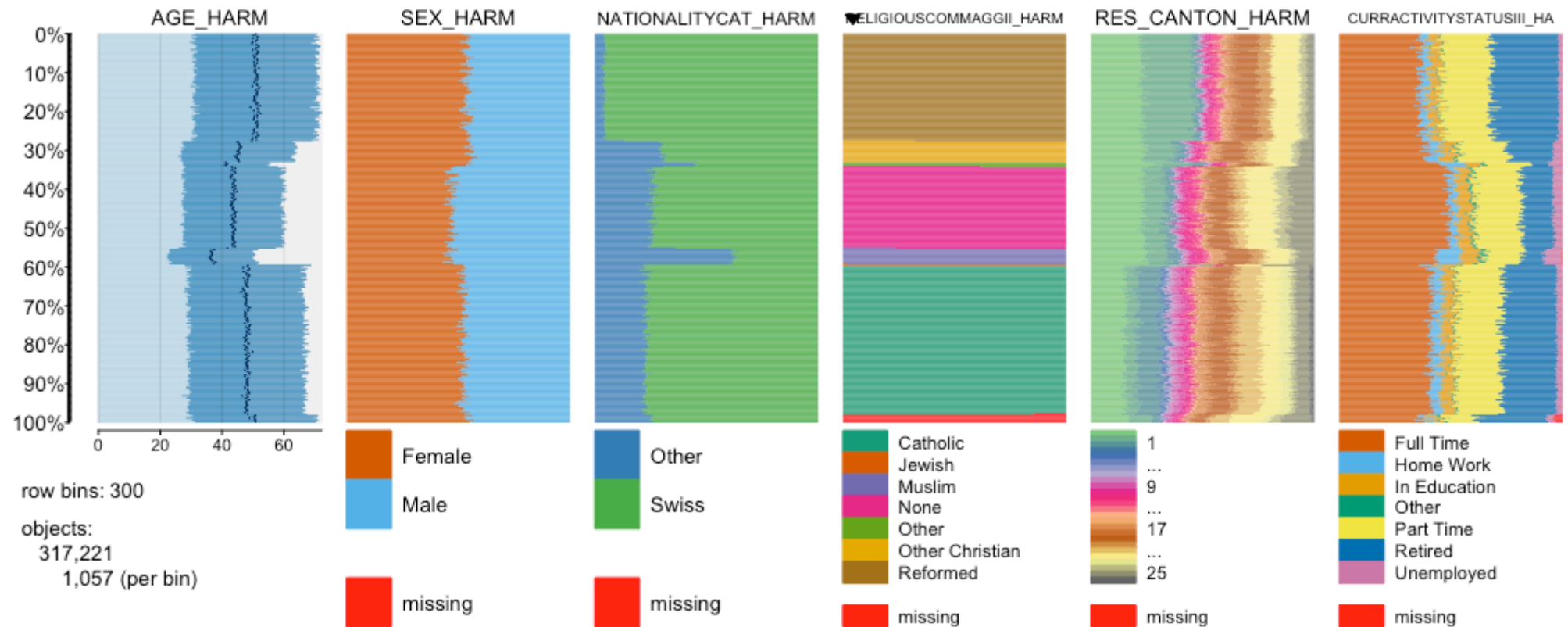
## Exploratory Visualization Using Table Plots



Decrease number of bins: more smoothing.

```
tableplot(data, sortCol=RELIGIOUSCOMMAGGII_HARM, nBins=10)
```

## Exploratory Visualization Using Table Plots

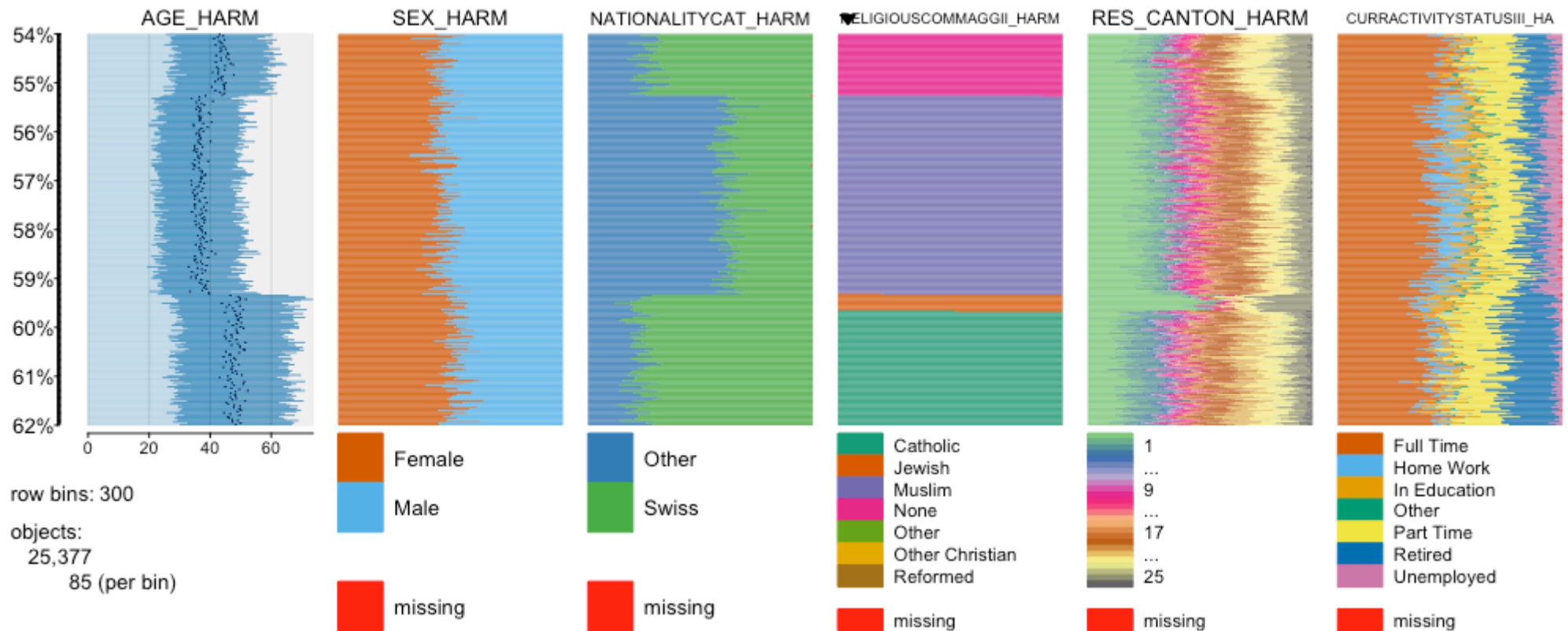


Increase number of bins: more variation and detail.

```
tableplot(data, sortCol=RELIGIOUSCOMMAGGII_HARM, nBins=300)
```



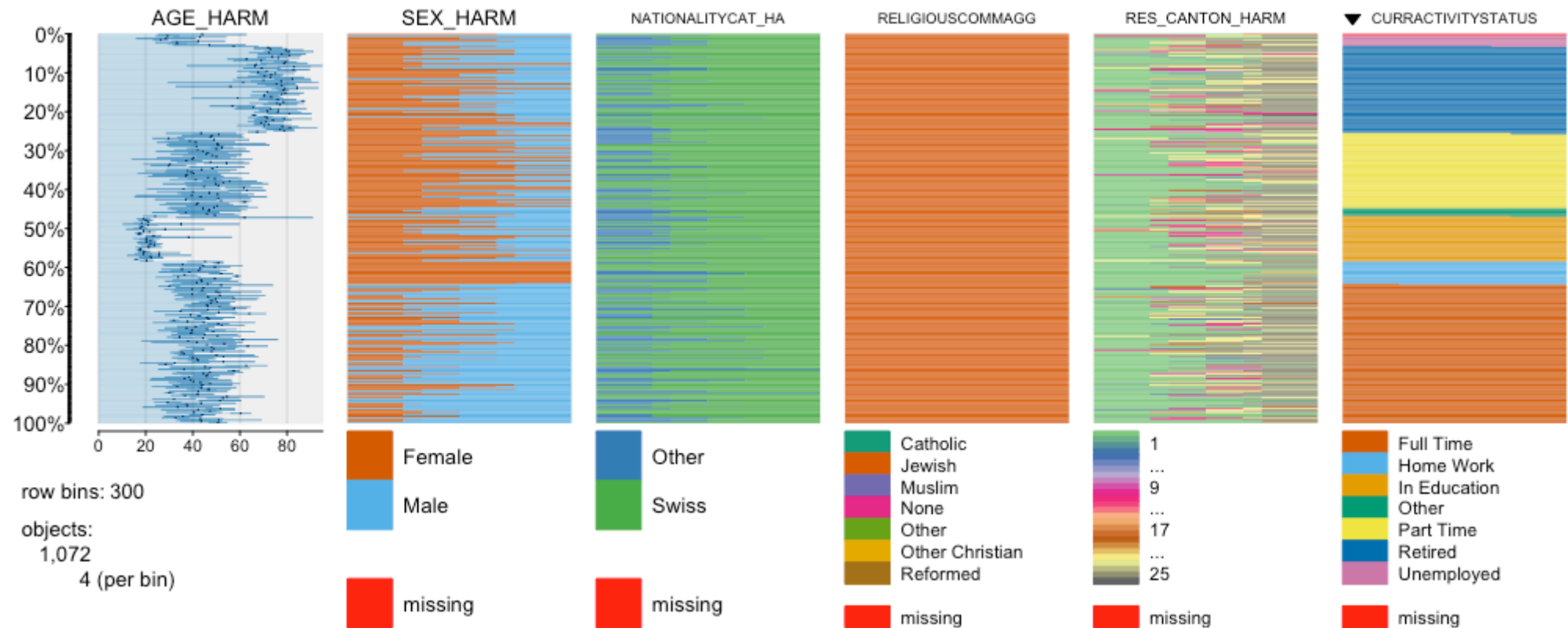
## Exploratory Visualization Using Table Plots



Zoom in.

```
tableplot(data, sortCol=RELIGIOUSCOMMAGGII_HARM, from=54, to=62, nBins=300)
```

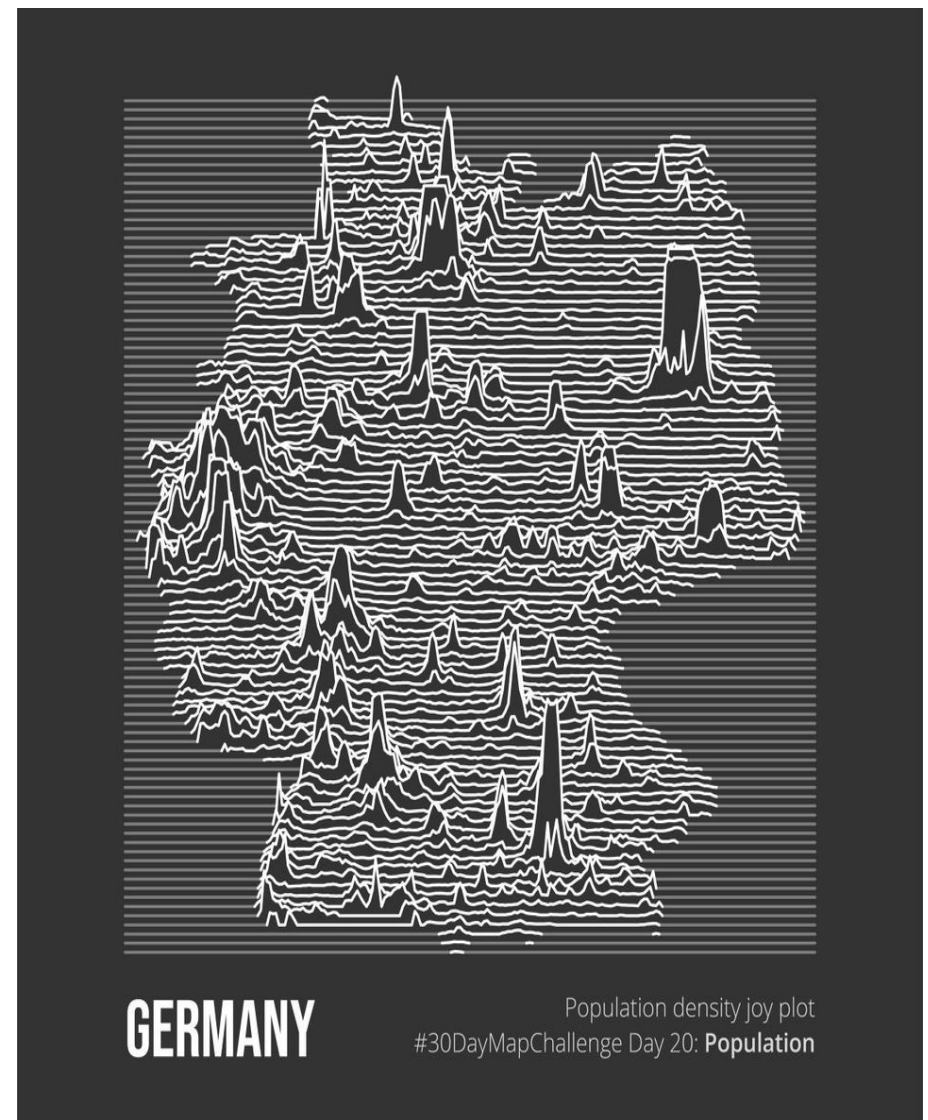
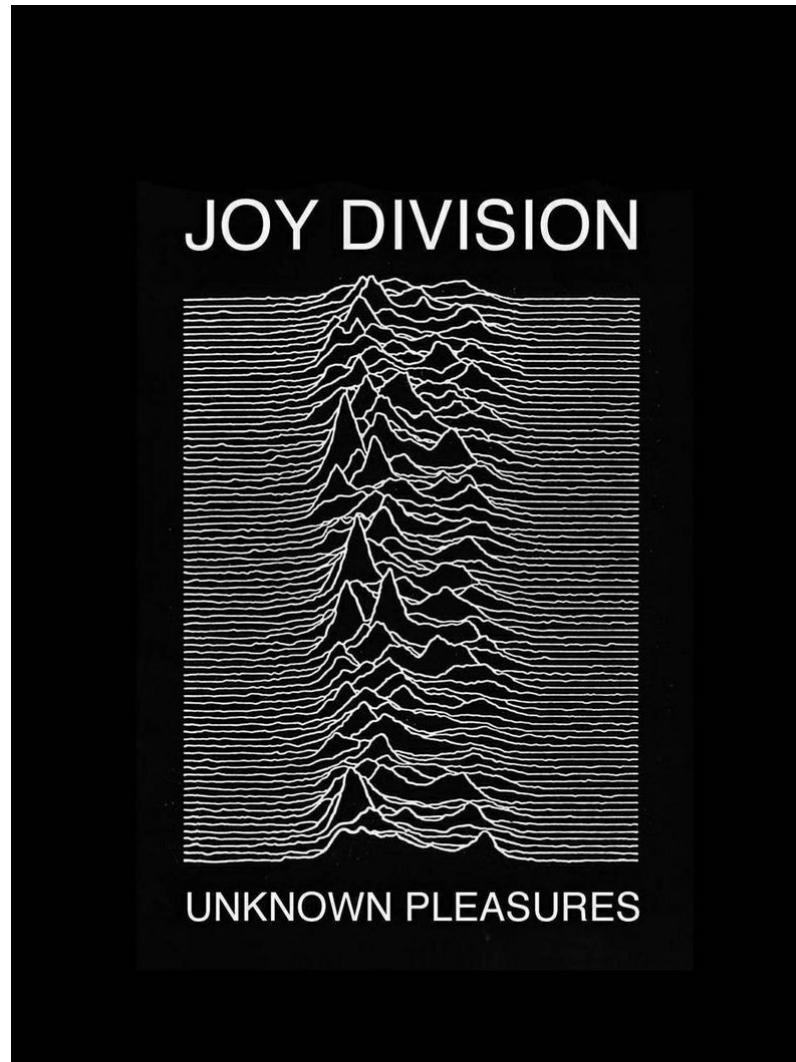
## Exploratory Visualization Using Table Plots



Filter and focus.

```
tableplot(data, sortCol=CURRACTIVITYSTATUSIII_HARM,
subset=RELIGIOUSCOMMAGGII_HARM=="Jewish", nBins=300)
```

How Do I Make a „Joy Plot Map“ in R?



## How Do I Make a „Joy Plot Map“ in R?

Biggest Issue: Data

→ Need population density along with longitude and latitude



Ingredients?

→ really just many lines of population densities!

→ placement is a bit tricky

## How Do I Make a „Joy Plot Map“ in R?

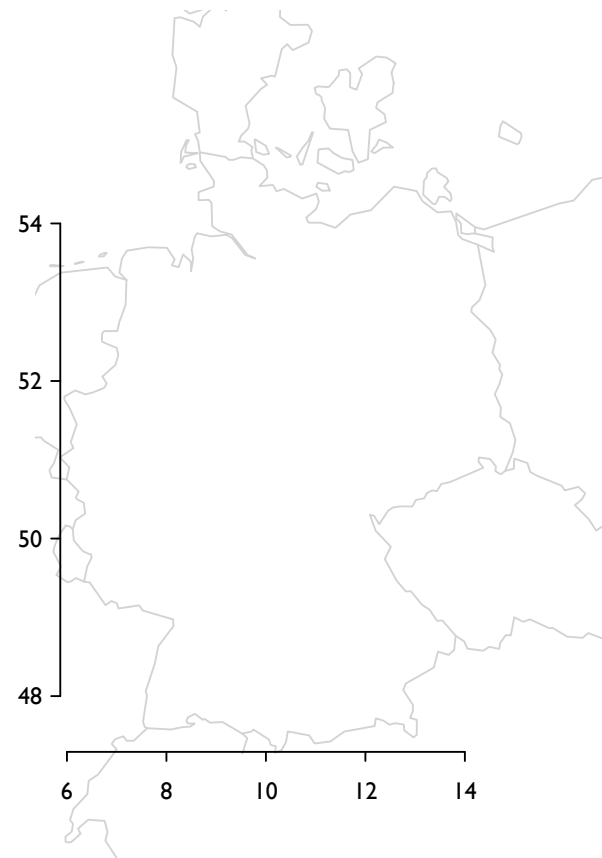
```
library(maps)  
map()
```



```
map(xlim=c(5.924, 14.988),  
    ylim=c(47.37, 55.02),  
    col="lightgrey")
```

```
axis(1)
```

```
axis(2)
```



```

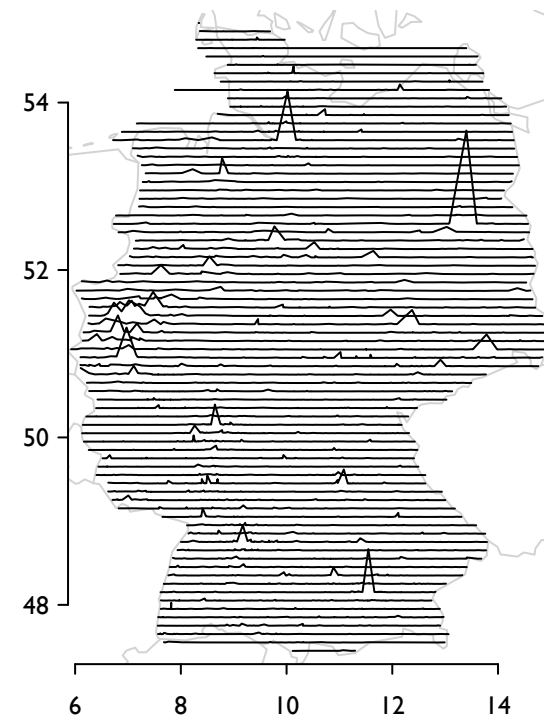
for(i in seq(47, 55, by=.1)){

ord <-
order(dat$INSIDE_X[dat$INSIDE_Y>i &
dat$INSIDE_Y<=i+.1])

lines(dat$INSIDE_X[dat$INSIDE_Y>i &
dat$INSIDE_Y<=i+.1][ord],
dat$UN_2020_E[dat$INSIDE_Y>i &
dat$INSIDE_Y<=i+.1][ord]/3000000+i+
.05)

}

```



```

par(bg="black")

plot(0,0, pch="", xlim=c(5.924,
14.988), ylim=c(47.37 , 60),
axes=F, ann=F)

for(i in seq(47, 55, by=.1)){

  ord <-
order(dat$INSIDE_X[dat$INSIDE_Y>i &
dat$INSIDE_Y<=i+.1])

  lines(dat$INSIDE_X[dat$INSIDE_Y>i &
dat$INSIDE_Y<=i+.1][ord],
dat$UN_2020_E[dat$INSIDE_Y>i &
dat$INSIDE_Y<=i+.1][ord]/50000+i+.
05, col=rgb(1,1,1,.5))

}

```

