

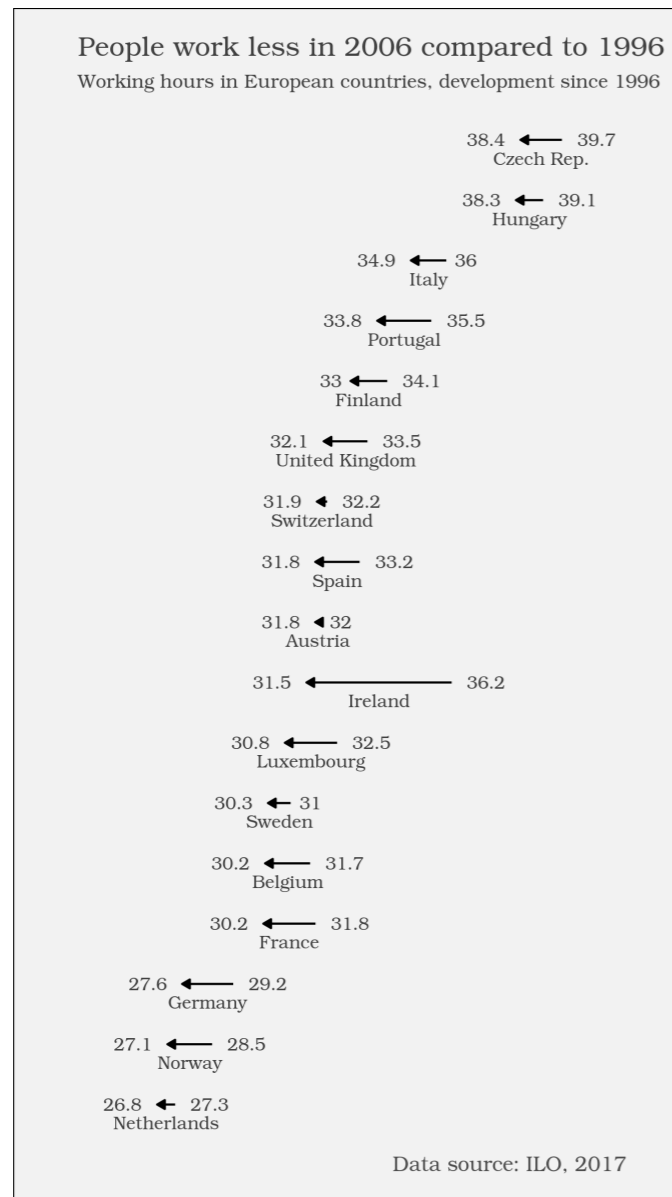
What is RMarkdown?

COMMUNICATING WITH DATA IN THE TIDYVERSE

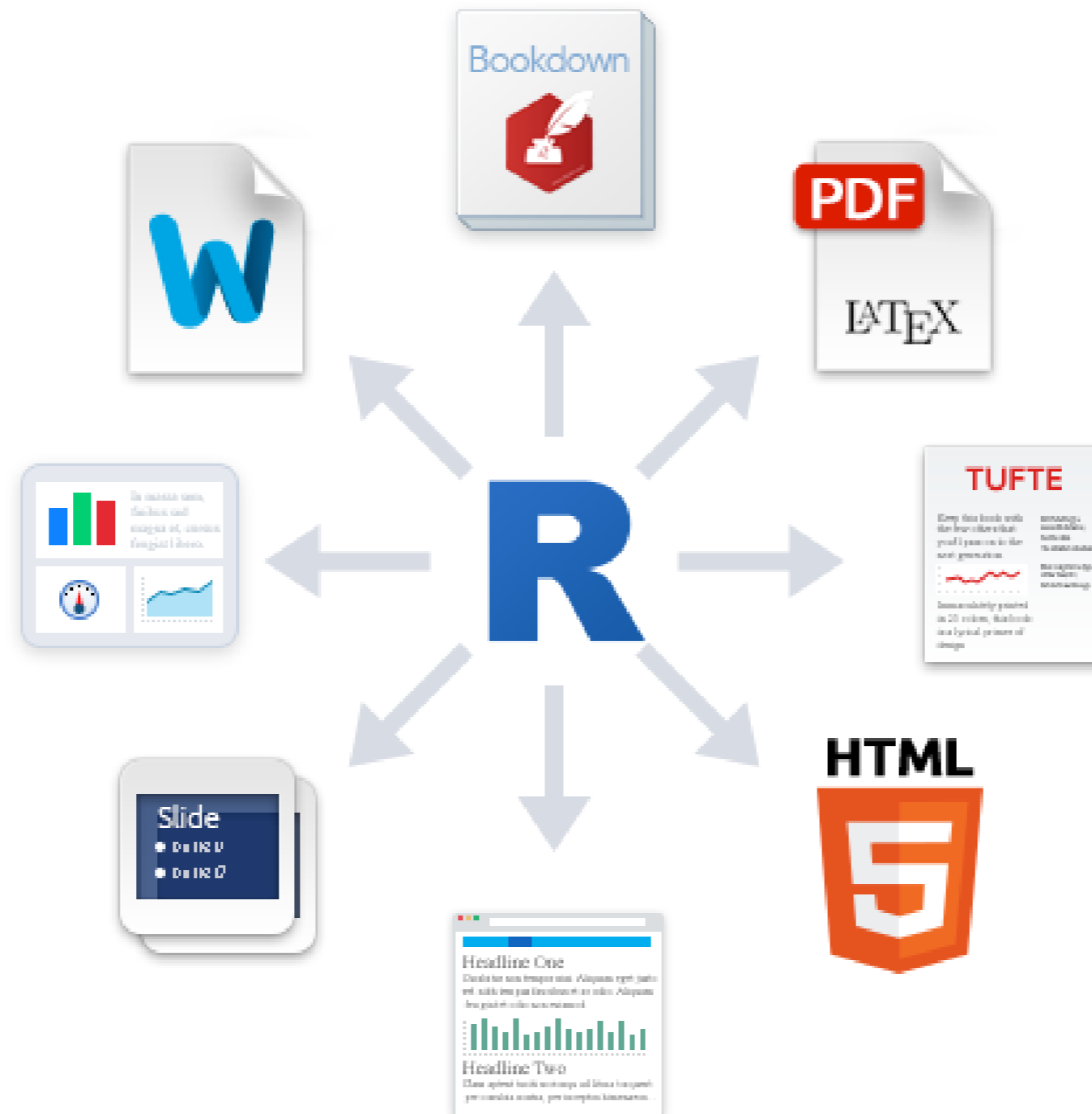


Timo Grossenbacher
Data Journalist

What you have done so far



- ...loaded the necessary libraries
- ...preprocessed the data with `mutate()` and `filter()`
- ...defined a custom theme
- ...created a dot plot
- ...polished that plot and made it fit for mobile screens



¹ Taken from rmarkdown.rstudio.com (<http://rmarkdown.rstudio.com/images/RMarkdownOutputFormats.png>)

```
1 ---
2 title: "The reduction in weekly working hours in Europe"
3 subtitle: "Looking at the development between 1996 and 2006"
4 author: "Timo Grossenbacher"
5 output:
6   html_document:
7     theme: cosmo
8     highlight: monochrome
9     toc: true
10    toc_float: false
11    toc_depth: 4
12    code_folding: show
13    css: styles.css
14    df_print: kable
15 ---
16
17 ## Summary
18
19 The International Labour Organization (ILO) has many [data
sets](http://www.ilo.org/global/statistics-and-databases/lang-en/index.htm) on
working conditions. For example, one can look at how weekly working hours have
been decreasing in many countries of the world, while monetary compensation has
risen. In this report, the reduction in weekly working hours in European
countries is analysed, and a comparison between 1996 and 2006 is made. All
analysed countries have seen a decrease in weekly working hours since 1996 - some
more than others.
```

19:376 # Summary R Markdown

~/Projekte/

Restarting R session...

Behind the scenes



¹ R for Data Science (<http://r4ds.had.co.nz/r-markdown.html>)

Reproducibility

Advantages

- others can reproduce and question your work
- you can automate your workflow

Prerequisites

- the code needs to be executable
- the data needs to be provided or at least linked to
- (the software environment needs to be known)

Let's practice!

COMMUNICATING WITH DATA IN THE TIDYVERSE

Formatting with Markdown

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Markdown

Markdown was created in 2004 by John Gruber, with the goal of of enabling people "to write using an easy-to-read, easy-to-write **plain text format**, then convert it to **structurally valid HTML**".

¹ Daringfireball.net
(<https://web.archive.org/web/20040402182332/http://daringfireball.net/projects/markdown/>)

Markdown

```
# A short text
```

```
## Introduction
```

```
Hello, *my name* is  
**Timo Grossenbacher** and I  
work at  
[SRF Data](https://srf.ch/data).
```

```
<h1>A short text</h1>
```

```
<h2>Introduction</h2>
```

```
Hello, <em>my name</em> is  
<strong>Timo Grossenbacher</strong>  
and I work at  
<a href = "https://srf.ch/data">  
SRF Data</a>.
```

A short text

Introduction

Hello, *my name* is **Timo Grossenbacher** and I
work at **SRF Data**.

Pandoc Markdown

RMarkdown = **Markdown prose** + R code

For all formatting options see the [Pandoc Markdown Reference](#)

**Let's put this into
practice!**

COMMUNICATING WITH DATA IN THE TIDYVERSE

R code in RMarkdown documents

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Analysis

Data

The herein used data can be found in the [statistics database of the ILO](#). For the purpose of this course, it has been slightly preprocessed.

```
load(url("http://s3.amazonaws.com/assets.datacamp.com/production/course_5807/datasets/ilo_data.RData"))
```

```
# Some summary statistics
ilo_data %>%
  group_by(year) %>%
  summarize(mean_hourly_compensation = mean(hourly_compensation),
            mean_working_hours = mean(working_hours))
```

```
## # A tibble: 27 x 3
##   year mean_hourly_compensation mean_working_hours
##   <fctr>          <dbl>          <dbl>
## 1 1980          9.267500          33.98103
## 2 1981          8.692500          33.61923
## 3 1982          8.355000          33.47409
## 4 1983          7.809091          33.86589
## 5 1984          7.543636          33.71051
## 6 1985          7.786364          33.73358
## 7 1986          9.700000          33.97494
## 8 1987         12.146923          33.58138
## 9 1988         13.199231          33.66441
## 10 1989         13.136154          33.53312
## # ... with 17 more rows
```

As can be seen from the above table, the average weekly working hours of European countries have been decreasing since 1980.

Adding R chunks

```
`r`  
x <- 2 + 2  
x  
`r`
```

4

```
2 plus 2 equals `r 2 + 2`.
```

2 plus 2 equals 4.

The `knitr` package



¹ R for Data Science (<http://r4ds.had.co.nz/r-markdown.html>)

R chunk options

```
```{r include=FALSE}  
x <- 2 + 2
x
```
```

```
```{r}  
x
```
```

More R chunk options

| Option | Effect |
|----------------------|--|
| <code>include</code> | Whether to show the R code chunk and its output. |
| <code>echo</code> | Whether to show the R code chunk. |
| <code>message</code> | Whether to show output messages. |
| <code>warning</code> | Whether to show output warnings. |
| <code>eval</code> | Whether to actually evaluate the R code chunk. |

More options on the [respective help page](#) of the `knitr` package.

Let's try this out!

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Images in RMarkdown files

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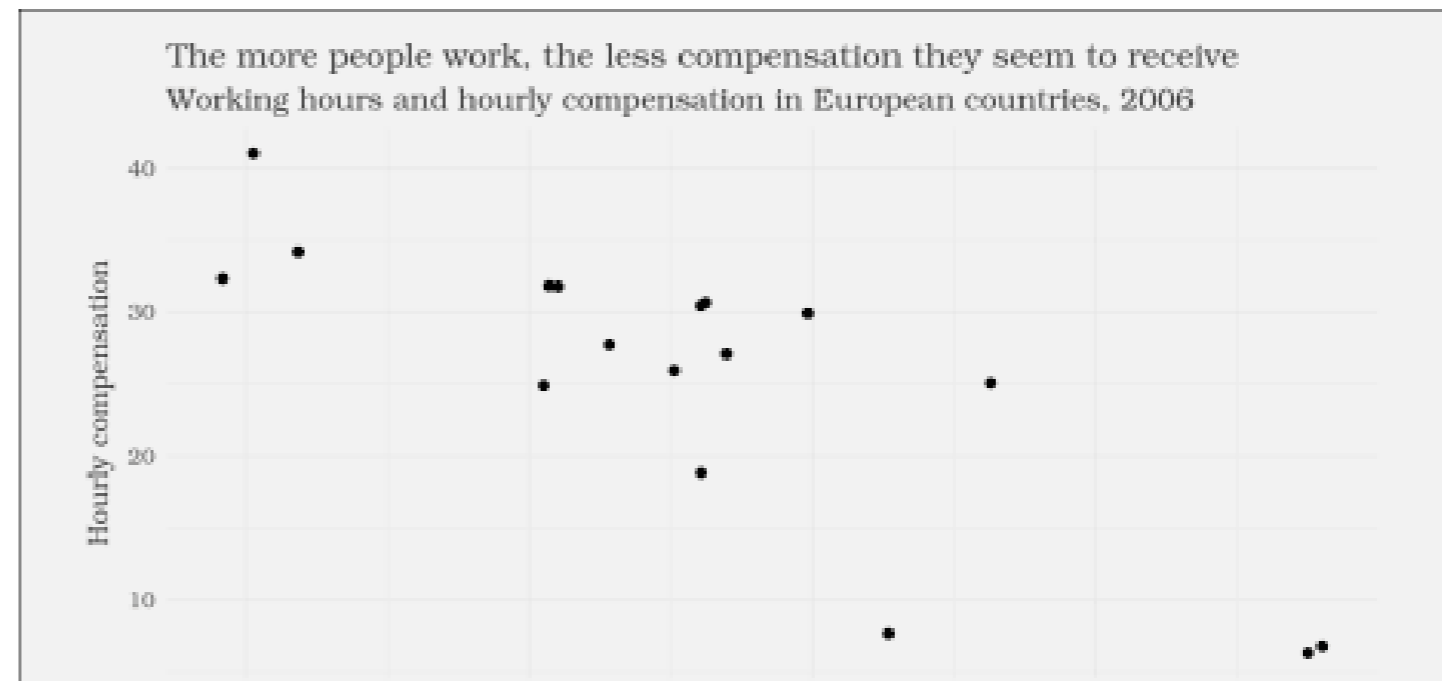
```
European countries have been decreasing since  
  
good time range for comparison.
```

R Markdown



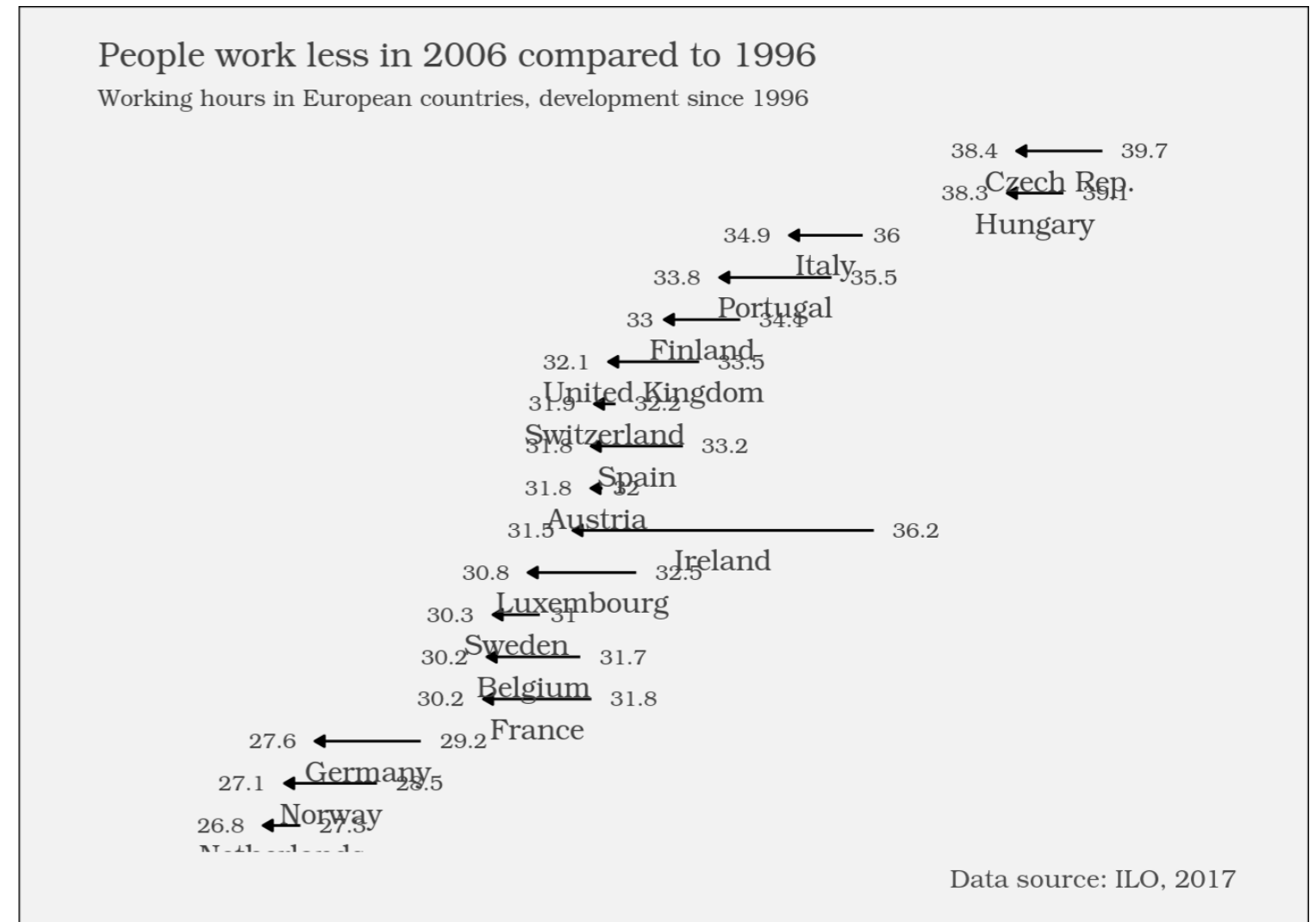
An interesting correlation

The results of another analysis are shown here, even though they cannot be reproduced with the data at hand.



Adjusting figure options in RMarkdown

```
```\r}\n\n... ggplot2 code ...\n\n```\n
```

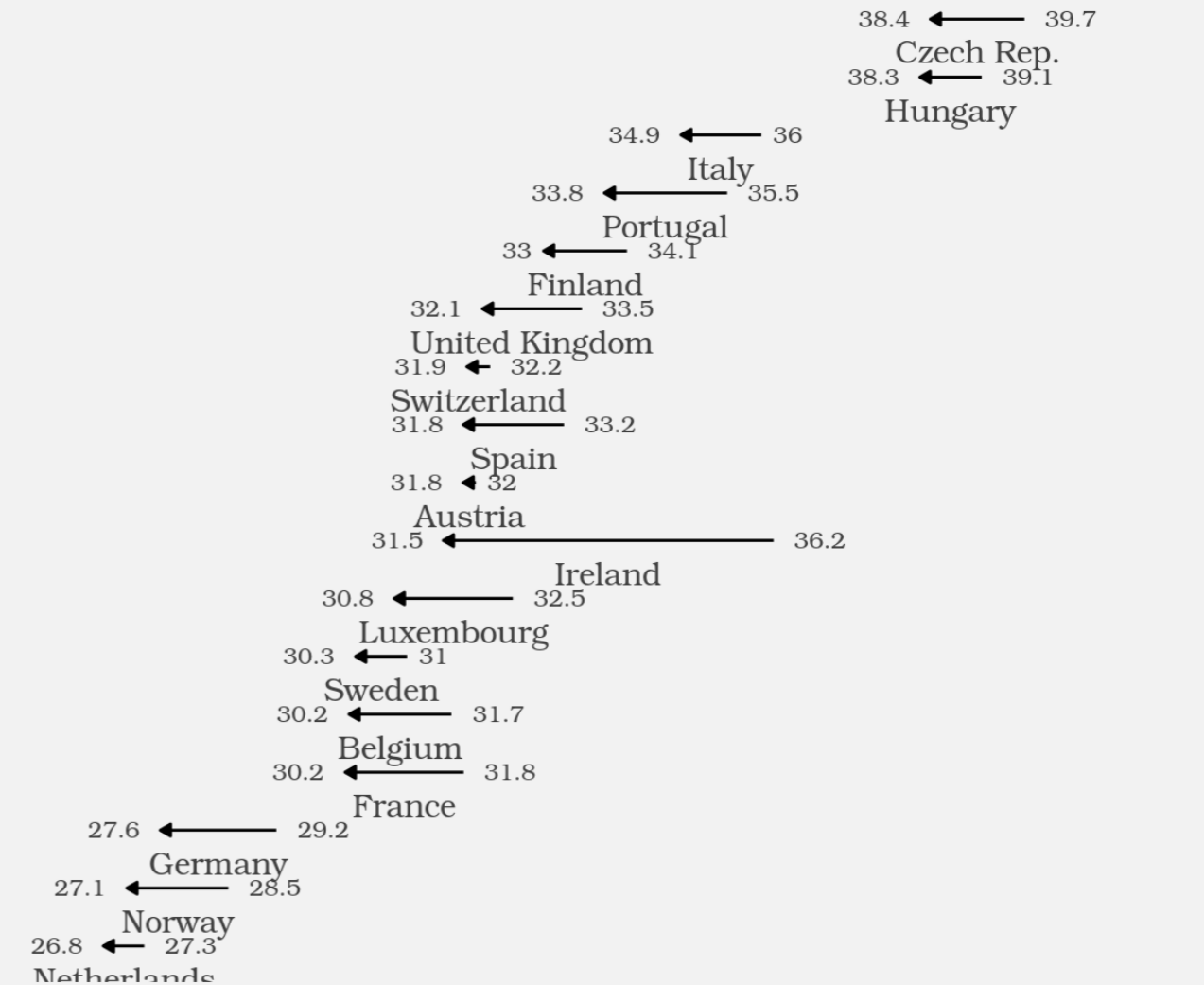


# Adjusting figure options in RMarkdown

```
```{r fig.height = 6}  
  
... ggplot2 code ...  
  
```
```

## People work less in 2006 compared to 1996

Working hours in European countries, development since 1996



Data source: ILO, 2017

# Figure options

| Option                  | Possible values                    | Effect                                    |
|-------------------------|------------------------------------|-------------------------------------------|
| <code>fig.height</code> | Numeric, inches                    | The height of the image in inches.        |
| <code>fig.width</code>  | Numeric, inches                    | The width of the image in inches.         |
| <code>fig.align</code>  | One of "left", "right" or "center" | The alignment of the image in the report. |

More options on the [respective help page](#) of the `knitr` package.



# External images in RMarkdown reports

```
![An impressive mountain](https://upload.wikimedia.org/wikipedia/commons/thumb/6/60/Matterhorn_from_Domh%C3%BCtte_-_2.jpg/1200px-Matterhorn_from_Domh%C3%BCtte_-_2.jpg)
```



An impressive mountain

# Let's practice!

COMMUNICATING WITH DATA IN THE TIDYVERSE