

## IMPRS-PHDS ELECTIVE COURSE IDEM 181

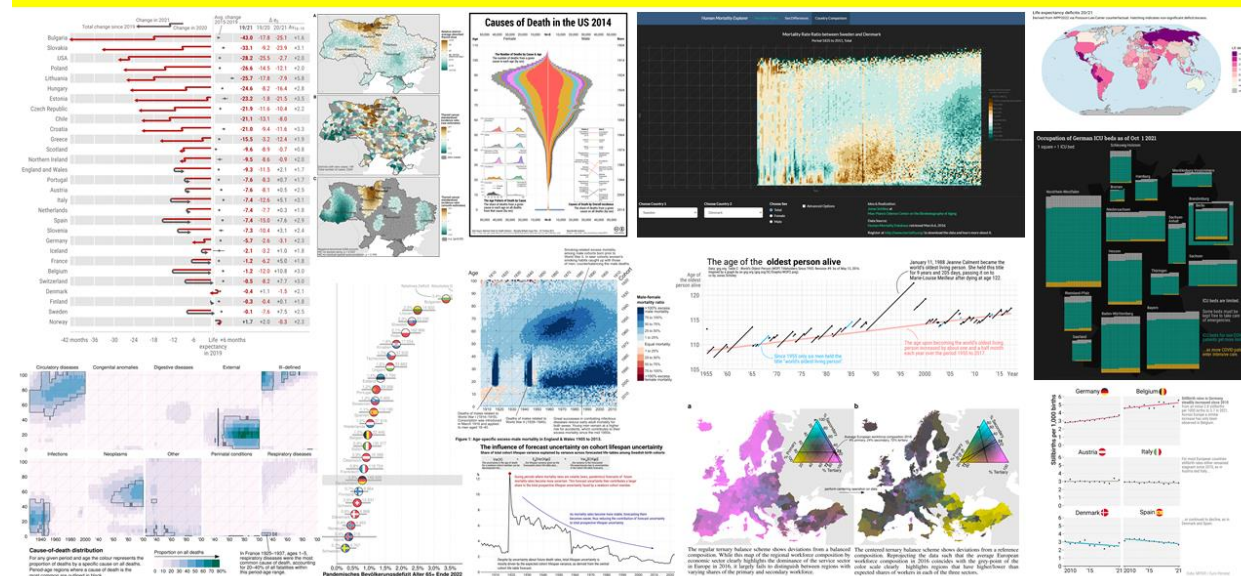
# Data Visualization Design

with Jonas Schöley




**IMPRS**  
for Population,  
Health and Data Science  
INTERNATIONAL MAX PLANCK  
RESEARCH SCHOOL

**MAX PLANCK INSTITUTE**  
FOR DEMOGRAPHIC RESEARCH



**Start date:** June 23, 2025

**End date:** June 27, 2025

**Location:** Max Planck Institute for Demographic Research (MPIDR). Onsite-only course.

**Instructor:** Jonas Schöley, MPIDR

## COURSE DESCRIPTION

“Data Visualization Design” is an intensive five-day workshop where participants practice the trade of data visualization. Visualization will be taught as a *design process*: In order to design effective visualizations, one needs to have a clear communication purpose in mind, know the audience, know a wide range of visualization idioms, be fluent in the tools required to transform imagination into a finished product, and be able to evaluate the effectiveness of the visualization. This broad range of skills requires the integration of theory and practice. Participants will learn about visualization theory, including human perception, marks and channels, the visualization design process, and best practices. They will create their own visualizations given a question and a dataset, recreate, criticize and improve upon existing visualizations, and – supported by the group and the lecturer – work on their own visualization project.



Upon completion of the course the participants will:

- understand visualization as a design process (as opposed to a set of techniques)
- formulate a question and design an effective visualization to answer it
- be able to rapidly explore a dataset using iterative visualization

Participants learn the technical skills to:

- use **R** in conjunction with **ggplot2**, **dplyr** and **tidyr** to create a wide range of static visualizations
- produce multi-layered maps and perform basic geocomputation using the **sf** package
- be able to produce interactive visualizations with **R** and **shiny** (a web-application framework for R)

## ORGANIZATION

“Data Visualization Design” is a 5-day workshop combining lectures and tutorials.

Time	Activity
09:30–09:45	(Monday only) Orientation meeting
10:00–12:00	lecture + tutorial
12:00–13:00	lunch break
13:00–14:30	lecture + tutorial
Afternoon	work on project proposal

**Day 1** Visualization design

**Day 2** Visual perception & Explorative visualization

**Day 3** Visualizing spatial data

**Day 4** Interactive visualization

**Day 5** Publication ready graphs & Project presentation

It is expected that students will spend about 6 hours per day on the course (including lectures, tutorials and work on project proposal). The course will be held as in-person event. A maximum of 20 students will be admitted to the course.

## COURSE PREREQUISITES

In their application for the course **participants need to propose a visualization project** which can be finished over the course of the week. I suggest to produce an explanatory graphic for a particular data set and topic.



Participants need to bring a laptop (if not, please contact [phds@demogr.mpg.de](mailto:phds@demogr.mpg.de)) with the latest available versions of R ([cran.r-project.org](http://cran.r-project.org)), and Inkscape ([inkscape.org](http://inkscape.org)) installed on it.

Participants must have basic experience in using R (loading data, installing and loading packages).

## EXAMINATION

Participants pass the course if they finish the visualization project outlined in their proposal.

## GENERAL READINGS

The seminal source for the course is:

- **Munzner, T. 2014. Visualization Analysis and Design. CRC Press.** This textbook is both comprehensive and approachable. It introduces visualization as a task driven design process as opposed to a set of ready-made techniques and teaches the knowledge necessary to design effective visualizations.

## FINANCIAL SUPPORT

There is no tuition fee for this course. Travel and accommodation expenses for admitted PHDS students will be covered by the MPIDR.

## APPLICATION INSTRUCTIONS FOR PHDS STUDENTS AND MPIDR SCIENTIFIC STAFF

There is an expedited application procedure for PHDS students and MPIDR scientific staff (pre-docs and post-docs). If you would like to enroll for this course, please send an email to [phds@demogr.mpg.de](mailto:phds@demogr.mpg.de). Begin your email message with a statement saying that you apply for course IDEM 181 – Data Visualization Design. You must also include a statement of motivation (PDF) that includes the following.

- A paragraph on how your research relates to the topic of the course, including a proposal for a visualization project to be completed during the course week (half a page or less);
- a paragraph describing your prior experience with data visualization and your fluency in R (half a page or less).

**Application deadline is April 4, 2025.**

Applicants will be informed of their acceptance by April 16, 2025.



## RECRUITMENT OF STUDENTS EXTERNAL TO THE IMPRS-PHDS NETWORK

Since there are only 20 seats available, we will initially offer them to our PHDS students as well as MPIDR scientific staff (pre-docs and post-docs). After the PHDS students and MPIDR scientific staff are accommodated, we may offer the remaining seats (if any) to pre-docs and post-docs from elsewhere through our IDEM website. Email inquiries about the course and the application process should be sent to [phds@demogr.mpg.de](mailto:phds@demogr.mpg.de).