

# Introduction in the statistical software R,

16-18 March, 2022

Please, fill in the questionnaire by 8<sup>th</sup> of March:

[https://docs.google.com/forms/d/e/1FAIpQLSd4vuPqinR1hWP0pnQfBNtplqBIAF\\_TVRYyIBC7Tq-wdo1og/viewform](https://docs.google.com/forms/d/e/1FAIpQLSd4vuPqinR1hWP0pnQfBNtplqBIAF_TVRYyIBC7Tq-wdo1og/viewform)

**Language:** German and English

**Speakers:**

**1. Dr. Katherine Ogurtsova**

Dr. Ogurtsova is working in the Institute for Health Services Research and Health Economics in German Diabetes Center. Her primary qualification includes statistical methods in medicine, epidemiology, and public health with the main focus on R-programming and methodological issues.

**2. Dr. Ralf Schäfer**

Dr. Schäfer is a psychologist and a head of Psychological laboratory at Clinical Institute for Psychosomatic Medicine and Psychotherapy at University Clinic in the Heinrich Heine University. Dr. Schäfer's research interest are psycho-physiological questions related to processing emotions and an investigation into the effectiveness of special psychotherapeutic therapies such as the effects of stress management training.

**3. Lotte Wagner-Douglas**

Lotte Wagner-Douglas is in the master's program in psychology at Heinrich Heine University and has been part of Dr. Schäfer's team for several years. Due to many years of programming experience with a focus on R as well as a broad knowledge of statistical methods, her main focus is on the processing and statistical analysis of data using R as well as active participation in current research topics.

**Requirements:**

Please, install the following software before the course

**R:** <https://cran.uni-muenster.de/>

**RStudio:** <https://rstudio.com/products/rstudio/download/>

YouTube how-to-do for Windows 10:

[https://www.youtube.com/watch?v=2sewGCA0y4&ab\\_channel=BecomingaDataScientist](https://www.youtube.com/watch?v=2sewGCA0y4&ab_channel=BecomingaDataScientist)

YouTube how-to-do for Mac OS:

[https://www.youtube.com/watch?v=LanBozXJjOk&ab\\_channel=DataSciencewithTom](https://www.youtube.com/watch?v=LanBozXJjOk&ab_channel=DataSciencewithTom)

**MS Teams:** <https://www.microsoft.com/en/microsoft-teams/download-app>

## Program of the course

Day 1

16. March 2022, 9:00 – 16:30

Time	Length	Topic	Lector
09:00 - 09:30	00:30	Introduction: history, examples, use	KO
09:30 - 11:00	01:30	Basics: Development environment, basic arithmetic, vectors and matrices, object assignments, data formats, data frames	RSch
		Data handling: Data import and export, data aggregation, sub sets, libraries	RSch
11:00 - 11:15	00:15	Pause	
11:15 - 12:00	00:45	Practical exercise (Data handling)	
12:00 - 12:30	00:30	Discussion	
12:30 - 13:30	01:00	Pause	
13:30 - 15:00	01:30	Transforming Data: pivot, split and combine data; handle missing data; select and join groups of observations and variables	KO
15:00 - 15:15	00:15	Pause	
15:15 - 16:00	00:45	Practical exercise (Data transformation)	
16:00 - 16:30	00:30	Discussion	

## Day 2

17. March 2022, 9:00 – 16:30

Time	Length	Topic	Lector
09:00 - 09:30	00:30	Overview of the previous day, feedback	RSch
09:30 - 10:15	00:45	Custom functions using the example of power analyses: pwr package, web power package, sample size calculation, power calculation, effect size	LWD
10:15 - 11:00	00:45	Easy descriptive analyses and basic graphs: Scatter plot, boxplot, histogram, psych packages, tables	LWD
11:00 - 11:15	00:15	Pause	
11:15 - 12:00	00:45	Practical exercise (Descriptive analysis, functions, power analysis)	
12:00 - 12:30	00:30	Discussion	
12:30 - 13:30	01:00	Pause	
13:30 - 15:00	01:30	Hypothesis Testing in R, Confirmatory Data Analysis in R: correlations, t-test, chi square, cohens d	LWD
		Basic graphs with ggplot	LWD
15:00 - 15:15	00:15	Pause	
15:15 - 16:00	00:45	Practical exercise (Confirmatory Analysis, graphs)	
16:00 - 16:30	00:30	Discussion	

Day 3

18. March 2022, 9:00 – 16:30

Time	Length	Topic	Lector
09:00 - 09:30	00:30	Overview of the previous day, feedback	RSch
09:30 - 10:15	00:45	Variance Analysis	RSch
10:15 - 11:00	00:45	General theory of regression analysis, linear regression	KO
11:00 - 11:15	00:15	Pause	
11:15 - 12:00	00:45	Practical exercise (Variance Analysis)	
12:00 - 12:30	00:30	Discussion	
12:30 - 13:30	01:00	Pause	
13:30 - 15:00	01:30	Building and analyzing linear regression model in R	KO
		Building and analyzing logistic regression analysis in R	KO
15:00 - 15:15	00:15	Pause	
15:15 - 16:00	00:45	Practical exercise (Simple Linear regression)	
16:00 - 16:30	00:30	Overview of the course, feedback, conclusions and recommendations	RSch