

Assignment. Tasks per week

In the assignment your group will write part of a research report. The research question is stated in your group assignment document. The end product is a report in the form of (part of) a scientific article. In the weekly tasks there will be detailed instructions on the format of the report.

The report (including tables/figures/statement on author contributions, excluding code) may not exceed 5 pages.

Week 1:

- Form a group, keeping in mind that different skills are needed: translating questions from the applied world to statistical formulas, mathematical skills, programming skills and writing skills.
- Formulate the research question for your assignment in two different ways.
 - In words such that an applied person can understand the question. See the skills platform Writing >> Writing a scientific paper >> Ch 2:introduction >> How to write the introduction >> Research aim (question and hypothesis)
 - Using the potential outcome notation.

Week 2.

- In the assignment you need to write a report in the form of (part of) a scientific article. We will ask you to formulate a research question, write a methods section, a results section and formulate a conclusion. To learn more about the format of scientific papers go to the skills platform and read the chapter: Writing >> Writing a scientific paper >> Chapter 1: Structure. Link: <https://brightspace.universiteitleiden.nl/d2l/le/lessons/27150/folders/361229>
- Formulate the three causal identifiability assumptions for your specific research questions and explore if these assumptions hold.

Week 3

- Make a DAG for your research question. You can do that using 'expert' knowledge, where you may consider yourself the expert.
- Use this DAG to specify for which variables you need to adjust in the analysis in order to meet the assumptions needed to answer your research question.

Week 4

- Apply outcome regression to the Framingham data. Calculate the estimate and 95% CI of the estimand you defined in week 2. Formulate the additional assumptions made in this analysis. If possible check the assumptions.

Week 5

- Apply propensity score reweighting to the Framingham data set. Formulate the additional assumptions made in this analysis. If possible check the assumptions.
- In your report we want you to present the details of one of the two analyses you performed on the data. Start thinking about what to mention in the methods section and the results section. Therefore read the theory of Chapter 3 (Methods) and Chapter 4 (Results) of Writing a scientific paper, on the skills platform.

Week 6

- Perform a missing data analysis for the variables used to answer your research question. Decide how you will proceed. Which assumptions are you making regarding the missing data mechanism.
- Start writing the methods section of your report. Use the skills platform for the requirements regarding a methods section (use full sentences, good distribution in paragraphs, formal way of writing).
- Divide the writing between the three members of your team, so that all three of you get writing experience. Then, let one of the other members of the team review the written part and provide feedback on the writing (see the skills platform >> (Peer-)feedback for tips on how to provide feedback) .Some important tips for peer feedback: (1) focus on the task, not the person. (2) be specific, not vague (3) do not forget to also indicate what went well!

Week 7

- Write the results session
- Add to your report a discussion part where you
 - Summarize the key findings in one paragraph
 - Describe the limitations (e.g. assumptions which may not hold)
 - Describe the final conclusions regarding the research question targeted to non-statisticians.

Week 8

- Submit your report in Brightspace.