

# 2023 STAT 528: Homework 2

Due Monday, January 30 at 11:59pm

## 1 Updating Report Graphics and Report Structure (50 points)

You are asked to edit your report from HW 1. Specifically, focus on:

- Updating your figures and tables using information from the recent lecture on statistical graphics as well as the in-class discussion.
- Responding to the individual feedback for your HW 1 submission.
- Update your writing to make sure it has the appropriate high-level structure (i.e. introduction, main body and conclusions) as discussed in the lecture on scientific writing.

The same requirements for HW 1 will apply to this report. You will be primarily graded on your improvements to statistical graphics in the report. To a lesser extent, you will also be graded on overall quality and improvement based on prior feedback, and on your writing. In HW 3, you will further improve your report writing, and so any efforts now will mean less efforts in the future.

## 2 A ‘before and after’ study of blood pressure (50 points)

In this section, you will be given a new dataset to explore.

**Description of the data.** Table 1 gives, for 15 patients with moderate essential hypertension, supine systolic and diastolic blood pressures immediately before and two hours after taking 25 mg of the drug captopril. The data were provided by Dr G. A. MacGregor, Charing Cross

Table 1: Blood pressures (mm Hg) before and after captopril

Patient no.	Systolic			Diastolic		
	before	after	difference	before	after	difference
1	210	201	-9	130	125	-5
2	169	165	-4	122	121	-1
3	187	166	-21	124	121	-3
4	160	157	-3	104	106	2
5	167	147	-20	112	101	-11
6	176	145	-31	101	85	-16
7	185	168	-17	121	98	-23
8	206	180	-26	124	105	-19
9	173	147	-26	115	103	-12
10	146	136	-10	102	98	-4
11	174	151	-23	98	90	-8
12	201	168	-33	119	98	-21
13	198	179	-19	106	110	4
14	148	129	-19	107	103	-4
15	154	131	-23	100	82	-18

Hospital Medical School, see MacGregor, Markandu, Roulston and Jones (1979) for a report on the investigation and appreciable further summary data. The objective is to evaluate the effectiveness of captopril for decreasing blood pressure (as measured via systolic and diastolic).

**Question.** (a) What are the shortcomings of the presented table for answering our scientific question?; (b) What are ways to improve upon this table? Think here about the types of response we may use and the manner in which we present the results; c) illustrate the strength of association between the systolic and diastolic response to the drug using a graph.

## Reference

MacGregor, G.A., Markandu, N.D., Roulston, J.E. and Jones, J.C., (1979). Essential hypertension: effect of an oral inhibitor of angiotension-converting enzyme. *Brit. Med. J.*, 2, 1106-9.