Figure 1:

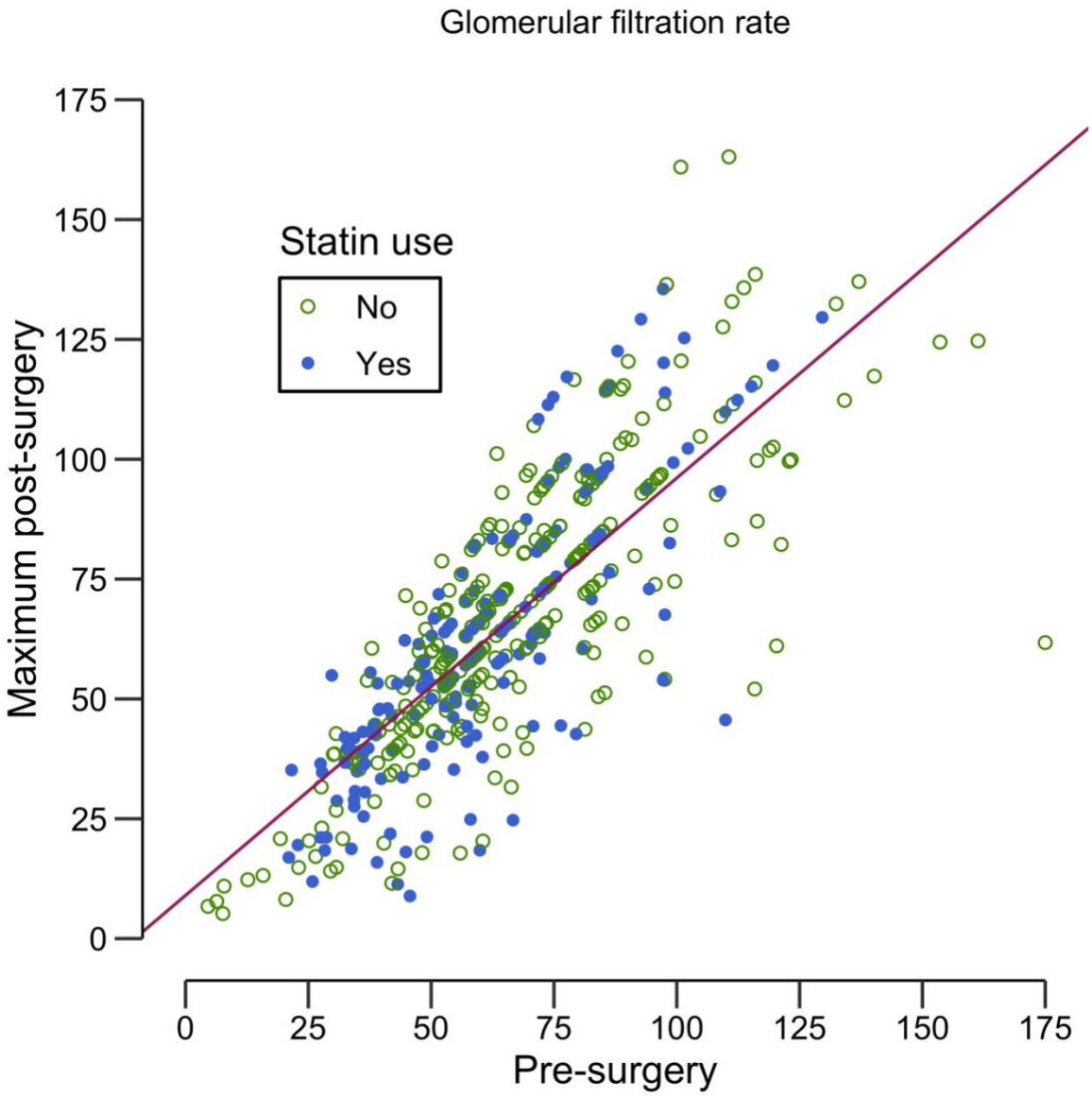

Table 2:

Reproduction of Table 2

Effect	Adjusted* difference (95% CI) in mean postoperative eGFR	P-value
Preoperative eGFR (increase of 20 ml min^(-1) 1.73 m^(-2))	16 (14, 17)	<0.001
Patient age (increase of 5 yr)	-2 (-3, -1)	<0.001
Weight (increase of 10 kg)	-1 (-2, 0)	0.01
Female gender (vs male)	-3 (-7, 1)	0.16
Diabetes (vs none)	-1 (-6, 3)	0.54
History of CHF (vs none)	-8 (-13, -2)	0.006
History of pulmonary disease (vs none)	0 (-4, 3)	0.81
History of chronic kidney disease (vs none)	-10 (-17, -4)	0.002
Use of acetylcysteine (vs none)	-1 (-6, 4)	0.68
Emergent case (vs scheduled)	-22 (-30, -15)	<0.001
Intraoperative haematocrit (increase of 0.05)	1 (-1, 2)	0.30
Total volume (increase of 0.1 litre kg^(-1) h^(-2))	-1 (-1, 0)	0.08
Crystalloids (increase of 1 litre)	1 (0, 2)	0.12
Colloids (increase of 0.5 litre)	-1 (-2, 0)	0.18
Statin use (vs none)	0 (-3, 3)	0.97

Commentary on Reproducing Results:

Overall, I believe I was able to reproduce the vast majority of the results and methods of the paper without too much difficulty. The paper was sufficiently descriptive in its process of deriving variables and utilizing regression procedures to allow for reproduction. Of course, minor differences exist between my reproduction and the real paper. I divide these differences into two classes: 1) the class of differences that are largely aesthetic in nature stemming from my inability to exactly reproduce visual differences and 2) potential differences where information from the paper was insufficient and I resorted to guessing or outside sources. Here, I describe these differences.

1) Differences in formatting and aesthetics:

Figure 1:

- The order of the “No” and “Yes” Statin labels is switched in the legend.
- My title text is proportionally slightly smaller.
- My lines (overlayed such that they look like one) extend all the way to the axis instead of truncating.
- The color of my lines and points does not exactly match those in the paper.

Table 2:

- I could not generate the small superscript outputs in my table labels

2) Missing information from paper:

1. In Figure 1, there is a single outlier observation that, when plotted, has an estimated preoperative GFR that exceeds the bounds of the graph axis (175). In the paper figure, my guess is that they truncated all points such that they did not exceed the edge of the graph (eg. mutate values greater than 175 to 175). Thus, this is what I did to reproduce the graph.
2. In reproducing Table 2, it was difficult to adjust the units for Intraoperative Haematocrit as in the data description dictionary its units were missing. By guess and check, I found that scaling the estimate and upper and lower bounds by 5 gave the correct value in the table, however this is missing in the paper.

Thoughts on the Reproduction Process:

The first step was to create the preoperative GFR and postoperative GFR estimates using the formula described in the paper which was straightforward. Creating the overlayed figure of postoperative GFR vs preoperative GFR colored by Statin usage was also straightforward except for the handling of the outlier point as mentioned above. The two regression lines were different only by a 0.19 shift (see regression coefficient outputs in the .rmd) thus on the plot they look identical – exactly as the paper found. I plotted the two lines using the coefficients taken from running the regressions. Next, I generated the final model using the covariates described in the paper. Immediately, I checked and saw that the P-values were identical. The final steps were creating the confidence intervals and adjusting variables for the table as some were scaled up or down. Of note, I had to use guess and check to identify the correct scale factor for Intraoperative Haematocrit as the units were not available in the data description.

As an overall note, the entire process would have been easier to replicate had the paper come with a codebase and a complete data dictionary describing variables.

To see the entire reproduction process please see my Github repo here at https://github.com/CalebKornfein/Recreate.