

# Exercise 3

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*November 04, 2015*

Today we have seen how to perform a t-test, an F-test and a proportion test, and that the R-output of these tests provides the confidence interval for the test statistic. We want to practice more with these tools.

- If we want to test if the variance in height is the same in women and men, which test can we perform? Can we reject the null hypothesis of equal variances?
- Which test can we use if, instead, we want to check if males are on average taller than females? Set an adequate alternative hypothesis.
- Analyze the confidence interval obtained in the previous point. Why doesn't it have an upper bound?
- Now look at the distribution of the variable **weight**: can we graphically state its normality? Perform a transformation in order to recover it.
- Test if the mean of the variable **weight** is 80 kg, testing  $H_0 : \log(weight) = \log(80)$  versus  $H_1 : \log(weight) \neq \log(80)$ .
- Use the previous command to give an interval estimate for the weight, in particular a confidence interval with level 0.99.
- Provide a punctual and an interval estimate for the prevalence of heart diseases and lung pathology.
- Test if the prevalence is statistically different between men and women.