

POSTGRADUATE COURSE IN  
LINEAR AND LOGISTIC REGRESSION

**Day 2**

**Afternoon exercises:**

**Part A**

Back to the lung function data (`lung`).

We will consider the multiple regression of `PEFR` on `height` and `sex`.

We will consider `sex` as a **categorical variable** and not use a dummy variable as in the exercise this morning.

Fit model with an **interaction** between `sex` and `height`

1. What is the estimated difference in the slopes (with CI) for men and women?  
Are the slopes statistically significant different?  
You also made such a comparison Monday morning.  
Compare this with what you just found.
2. What is the estimated difference (with CI) in expected PEFR for a man and a woman both 170 cm high?  
Are this difference statistically significant?  
You also made such a comparison Monday morning.  
Compare this with what you just found.

**Part B**

Here we look at data from the lecture today (`fram200`) and the model

$$\ln(sbp) = \beta_0 + \beta_1 \cdot age + \beta_2 \cdot woman + \beta_3 \cdot \ln(bmi) + E$$

3. Fit a model with `sex` as a categorical variable and an **interaction** between `sex` and `age`, using **men** as reference for `sex`.  
Spend some time trying to understand the estimates.
4. Fit the same model but now with **women** as reference.  
Spend some time trying to understand the estimates.
5. Combine your findings into a conclusion on whether or not there is interaction (effect modification) between `sex` and `age`.