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Congratulations!

Personal exercises session 1

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```
library(tidyverse)
library(rjags)
library(coda)
library(bayesmeta)
library(pCalibrate)
```

```
## Warning in .recacheSubclasses(def@className, def, env): undefined subclass
## "ndiMatrix" of class "replValueSp"; definition not updated
```

Exercise 1

a)

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The group investigates the safety and efficacy of Secukinumab for the treatment of ankylosing spondylitis compared to a placebo. Secukinumab is an antibody for IL-17, which is a pro-inflammatory cytokine believed to be involved in the pathogenesis of ankylosing spondylitis.

b)

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```
dat <- matrix(data = c(14, 9, 1, 5), ncol = 2, byrow = T)
rownames(dat) <- c("Secukinumab", "Placebo")
colnames(dat) <- c("Response", "No response")
message("Data:")
```

```
## Data:
```

```
print(dat)
```

```
##             Response No response
## Secukinumab       14           9
## Placebo            1           5
```

```
message("Chi-squared test:")
```

```
## Chi-squared test:
```

```
chisq.test(dat)
```

```
## Warning in chisq.test(dat): Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  dat
## X-squared = 2.1637, df = 1, p-value = 0.1413
```

```r
message("Fisher's exact test:")
```

```
## Fisher's exact test:
```

```r
fisher.test(dat)
```

```
##
##  Fisher's Exact Test for Count Data
##
## data:  dat
## p-value = 0.08008
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##    0.6570166 392.5294804
## sample estimates:
## odds ratio
##   7.259346
```

The reported p-values don't make me too excited about the results.

How would you explain a non-significant result to a client?

c)

```r
power.prop.test(p1 = 0.6, p2 = 0.25, power = 0.8, sig.level = 0.05)
```

```
##
##      Two-sample comparison of proportions power calculation
##
##               n = 30.10887
##              p1 = 0.6
##              p2 = 0.25
##       sig.level = 0.05
##           power = 0.8
##     alternative = two.sided
##
## NOTE: n is number in *each* group
```

The reported optimal n = 30.1 matches neatly with the actual n = 30

31 patients in one group means 62 patients for both groups involved in the study.

Exercise 2

My best guess, without cheating:
- Mean: 172 cm
- std-dev: 12 cm

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Exercise 3

Everything works :)

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Exercise 4

1/1

What is your motivation to attend this course?

I want to learn how to actually apply Bayesian methods to real data and how to interpret the results. From talking to many people I've been convinced that this kind of statistics is highly relevant to everyday life,

as the human mind is a) very bad at understanding probabilities without guidance and b) working in a Bayesian way by default. I've seen people apply Bayesian statistics as back-of-the-envelope calculations for life decisions and I want to be able to do that too.

My MSc. is in neural systems and computation, where I have also encountered Bayesian statistics in the context of neuroscience and machine learning. This left me largely scratching my head, as I didn't understand the jargon, much less the content of the graphs and the meaning of the numbers involved. I want to change that.

What would you like to learn in this course and why?

- How to do back-of-the-envelope calculations for life decisions.
- How to apply a Bayesian framework to biological data.

Have you already learned or used Bayesian methods?

Only basic stuff, like the concept of a prior and a posterior, and the idea of a likelihood. I've worked with Bayes' theorem in the context of probability theory and statistics, but it was not much to write home about.

If yes, which Bayesian methods and programs are you familiar with?

N/A

What is your experience with scientific writing?

I've written multiple scientific documents and incorporated feedback on all of them, so I think I'm alright.