

1

Anaemia data, one sample

Hb	n
9 - 12	46
12 - 13	19
13 - 14	59
14 - 17	16
tot	140

The table represents the distribution of Haemoglobin in a sample of male patients after treatment. Answer to the following questions (T/F) :

- Roughly one patient out of 3 was anaemic ($Hb < 12$)
- The median was between 13 and 14
- The mean was between 13 and 14
- The distribution was perfectly symmetric
- The mean was significantly lower than 13 [assume the population variance is known and equal to 5, fix $\alpha = 0.05$ and use a 2-sided test]
- The 95% CI of the mean of the population included the value 13
- Haemoglobin in the population is included between 12.23 and 12.97

2

Anaemia, two groups

In a hospital, a group of 40 patients gets drug A, and a group of 35 patients gets drug B. Clinicians are interested in the value of Haemoglobin after treatment, they observe:

$$\bar{x}_A = 10.2 \quad s_A = 3.1$$

$$\bar{x}_B = 9.8 \quad s_B = 3.0$$

Answer to the following questions (T/F) :

- The overall mean is equal to 10
- Variability is slightly higher in group A
- The appropriate test to compare Haemoglobin in the two groups is a T-test for paired samples
- Knowing that the comparison test gives $p\text{-value} = 0.57$, we conclude that the difference is almost significant and worth further observation

3

Response, two groups

In a hospital, a group of 40 patients gets drug A, and a group of 35 patients gets drug B. Clinicians observe that respectively 32 and 19 patients responded. Answer to the following questions (T/F) :

- The risk ratio comparing A vs. B is 1.68
- A is more efficacious than B by about 50%
- The observed difference is significant at 5% level
- The observed difference is significant at 1% level

4

Death due to surgery

In a hospital, a group of 10 elderly patients undergoes heart surgery; there is 10% probability of dying during the surgery. Answer to the following questions:

- What is the probability that they all survive?
- What is the probability that at least one dies?
- What is the probability that exactly one dies?
- What is the probability that more than one dies?

5

Death due to surgery

In a hospital, a group of **300** elderly patients undergoes heart surgery; there is **1%** probability of dying during the surgery. Answer to the following questions:

- What is the probability that they all survive?
- What is the probability that at least one dies?
- What is the probability that exactly one dies? **And exactly two?**
- What is the probability that more than one dies?

6

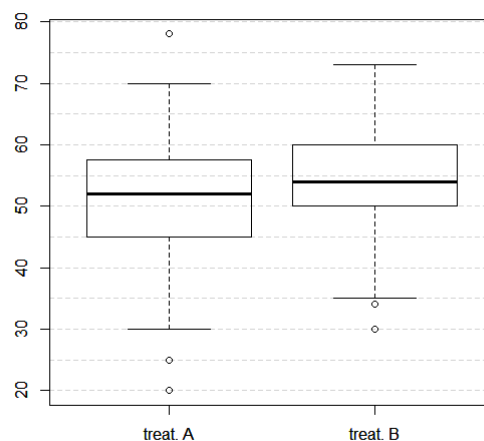
Quantiles

LVEF in two treatment groups

The graph (boxplot) illustrates the LVEF of two groups of patients given two types of treatment for cardiac disease.

Knowing that there were 143 and 222 patients respectively in group A and in B:

- How many patients in A had less than 45 LVEF?
- How many patients in B had more than 60 LVEF?
- What was the percentage of B pts with LVEF between 50 and 60? How many were they?



Diagnosis

Jack and Daisy are undergoing a test to detect the presence of a genetic abnormality ("disease", D). Jack has a familiarity, so his prob of D is 0.2. For Daisy instead it holds a general assumption that $p(D)=0.05$. The diagnostic test has sensitivity 90% and specificity 85%.

- What is the probability that Jack gets a positive outcome? And for Daisy?
- What is the probability that they both get a positive outcome?
- What is the probability Jack has the disease if he gets a positive test? And what about Daisy?