

Type of problemes not practiced during the semester

Nonparametric tests

- Find the ranks to the following data: 199, 126, 81, 68, 112, 112.
Data in increasing order: 68, 61, 112, 112, 126, 199
Ranks: 1, 2, 3, 4, 5, 6
Ranks corrected for ties: 1, 2, 3.5, 3.5, 5, 6

Fourfold (2x2) tables

- In a study of measurement of agreement, the observed and expected probabilities were 0.85 and 0.5, respectively. Calculate the kappa statistic!

$$\kappa = \frac{p_0 - p_E}{1 - p_E} = \frac{0.85 - 0.5}{1 - 0.5} = \frac{0.35}{0.5} = 0.7 \text{ (acceptable agreement - } \hat{\mu} < 0.75)$$

- In a study 40 HPV positive tests of 50 abnormal cervical samples and 10 HPV positive tests of 60 normal cervical samples were detected. Calculate the odds ratio!

	Cervical abnormal	Cervical normal	Total
HPV positive	40	10	
HPV negative			
	50	60	

odds of an abnormal if the test is positive: 40:10=4

odds of an abnormal if the test is negative: 10:50=1/5=0.2

Odds ratio=4/0.2=20 the odds to be cervical abnormal is 20 times higher than that in the negative case.

- The risk of HPV infection for smokers was measured in a study. The calculated odds ratio was 1.58 with 95%CI [1.061 - 2.398]. We decide...
to reject the null hypothesis of equal odds (H0: OR=1), because the confidence interval does not contain 1. The odds ratio=1.58 is significantly different from 1.
- The risk of HPV infection for smokers was measured in a study. The calculated odds ratios was 1.58 with 95%CI [0.961 - 2.598]. We decide ...
- In a study 8 HPV positive tests of 20 abnormal cervical samples and 10 HPV positive tests of 20 normal cervical samples were detected. Calculate the odds ratio!

Survival analysis

- In a study the average period of time of free of disease was 3.1 year and SE=0.44. Compare this result to the reference 2.2 years of survival rate using a 95% confidence interval!
H0: the survival year is equal to the reference 2.2 years of survival.
st=3.1
se=0.44

95% confidence interval: $s_t \pm 1.96 * \hat{se}(s_t)$

lower limit: $3.1 - 1.96 * 0.44 = 3.1 - 0.8624 = 2.2376$

upper limit: $3.1 + 1.96 * 0.44 = 3.1 + 0.8624 = 3.9624$

95% CI: (2.2376 - 3.9624). As the reference value 2.2 is not included in the interval, the 3.1 yesr survival is significantly different from the reference 2.2 years of survival.

- In a study the average period of time of free of disease was 3.1 year and SE=0.44. Compare this result to the reference 2.2 years of survival rate! What is the null hypothesis ?
- In a cohort study the first year the interval survival rate was 0.99. In the following four years the annual interval survival rates were 0.98, 0.97, 0.96 and 0.95, respectively. Calculate the 5-year cumulative survival rate!
it is $0.98 \cdot 0.97 \cdot 0.96 \cdot 0.95 = 0.8669472$
- In a cohort study the first year the interval survival rate was 0.90. In the following four years the annual interval survival rates were 0.90, 0.90, 0.90 and 0.90, respectively. Calculate the 5-year cumulative survival rate!