Practical P7 Logistic Regression

OOA Course Basic Medical Statistics

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1.

The table presents an example of results for a cohort study. Calculate the Odds Ratio.

	>2 alcohol units / day	<= 2 alcohol units/day
Head and Neck Cancer yes	20	24
no	980	23540

2. (*logistic regression procedure in SPSS: analyze – regression – binary logistic*)

You received a dataset "trismus.sav".

Head and neck cancer patients treated with chemoradiation are at risk for developing trismus (reduced mouth opening < 35 mm). Trismus is a side-effect of treatment that impairs eating, speech and oral hygiene. In this practical, we are going to investigate whether the dose delivered to the Masseter Muscle is predictive for developing Trismus.

a. Construct a frequency table of the variable 'trismus'. What is the probability of developing Trismus for a patient, based on this information ?

b. Is the Mean Dose to the Ipsilateral Masseter Muscle significantly associated with Trismus ? What is the Odds Ratio ? Does the 95% Confidence Interval of the OR include 1 ? Test the Goodness-of-Fit.

You can find Exp(B) (estimate of Odds Ratio) in the table: 'var's in the equation' (at the end of the output). You have to tick the box "95%CI" under 'options'.

c. Is the Mean Dose to the Contralateral Masseter Muscle significantly associated with Trismus ?

d. Test the Goodness-of-Fit.

e. Does a model with Ipsilateral mean dose, significantly improve when you add Contralateral dose ?

For this purpose, use a stepwise model (e.g. forward conditional), press the button 'options' and change the 'probability for stepwise' to higher values for entry and removal (e.g. both 0.9).
To choose a model, click on the button next to "Methods" in the Log Reg window.

f. Create again a model with the covariate 'Mean dose Ipsilateral Masseter Muscle', but this time: save the probabilities (menu: press the button SAVE and tick the box 'probabilities'). You can find the probabilities now in your database (last column).

Construct a scatter plot with Mean dose Ipsilat Masseter on the x axis and the probability on the y axis (GRAPHS-LEGACY DIALOGS-SCATTER-SIMPLE SCATTER). Put 'trismus' at 'set markers by'.

g. Construct a formulae Probability (Trismus=1) = .. based on Mean Dose Ipsilateral Masseter. Calculate the probability of Trismus for a patient treated with a Mean Dose (ipsilateral) of 75 Gy. Do you find this a reliable estimate (compare the answer with the plot you made). Why / Why not ?

h. If you have time left: you could explore these data using linear regression, modelling the relative reduction in mouth opening as an outcome, and compare output with the current results.