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Morten Frydenberg

POSTGRADUATE COURSE IN
LINEAR REGRESSION MODELS FOR CONTINUOUS AND BINARY DATA

Day 4

Morning

Consider the dataset: "`obese.dta`". As in the lecture will look at the outcome "obsese" and the three explanatory variables: `sex, scl` and `age`. We here use age as a continuous variable and set the reference age to 50 year and reference sex to men.

1. Fit the binary regression model:
$$\Pr(obese) = \beta_0 + \beta_1 \cdot Woman + \beta_2 \cdot (age - 50) + \beta_3 \cdot (scl - 200)$$
Explain all the estimates in the model.
Compare the estimates based on this model with the estimates from the RD model from the lecture, where age was introduced as a categorical variable.

2. Find (with CI) , based on the model:
The RD between two women, where the first is 55 year old and has scl = 190 and the second is 50 year old and has scl = 210.
The RD between two women, where the first is 55 year old and has scl = 195 and the second is 50 year old and has scl = 215.
The RD between a woman that is 55 year old and has scl = 195 and a man that is 60 year old and has scl = 215.
Find the risk of being obese for a 55 year old woman with scl = 190.

3. Introduce an interaction term between sex and age:
$$\Pr(obese) = \alpha_0 + \alpha_1 \cdot Woman + \alpha_2 \cdot (age - 50) + \alpha_3 \cdot (age - 50) \cdot Woman + \alpha_4 \cdot (scl - 200)$$
Fit this model.
Explain the three estimates related to sex and age in this model.
Explain the three p-values related to sex and age in this model.

4. Find (with CI) , based on the model:
The RD between two women, where the first is 55 year old and has scl = 190 and the second is 50 year old and has scl = 210.
The RD between a woman that is 55 year old and has scl = 195 and a man that is 50 year old and has scl = 215.
Find the risk of being obese for a 55 year old woman with scl = 190.

5. Repeat 1 to 4, but now with the two Risk Ratio model.