

Homework # 5

Biostatistics 210

DUE December 3, 2019 by 10:30 to the TA Mailbox

This assignment will give you practice in applying a propensity based analysis to estimate causal effects.

1. DOWNLOAD

Download the datasets `hwk5.dta` from the course website. The variables are

- id (participant ID)
- died (1=died, 0=survived)
- hepatom (hepatomegaly: 1=present, 0=absent)
- edema (1=present, 0=absent)
- female (1=female, 0=male)
- bilirubin (in mg/dL)
- copper (copper in mg/dL)
- ast (AST in mg/dL)
- age (age at diagnosis in years)

2. CREATING PROPENSITIES

The primary interest is in estimating the causal effect of hepatomegaly on survival. Create a simple propensity model (no splines or interactions), make the quantiles, and evaluate the overlap.

```
logistic heptom female edema bilir copper ast age
predict out, p
xtile group=out, nq(5)
tab group heptom
```

*Question 1: (a) What percent of people in the lowest quintile have hepatomegaly?
(b) What percent of people in the highest quintile have hepatomegaly? Does there appear to be reasonable overlap?*

3. TESTING INTERACTION

Assess if the effect of hepatomegaly on survival appears homogeneous?

```
cc died heptom, by(group)

logistic died i.heptom##i.group
est store A
logistic died i.heptom i.group
lrtest A
```

Question 2: What do you conclude? Is there evidence of interaction?

4. CONDITIONAL ODDS RATIO

Question 3: Estimate the conditional odds ratio

```
logistic died i.hepatom i.group
```

5. CAUSAL MEAN AND AVERAGE CAUSAL EFFECT

Question 4: (Assuming no unmeasured confounders) If the entire population had hepatomegaly, what proportion would have died during follow-up? If the entire population did not have hepatomegaly, what proportion would have died during follow-up? What is the estimated risk difference?

```
logistic died i.hepatom i.group  
margins hepatom  
margins, dydx(hepatom)
```

6. REGRESSION MODEL

Question 5: Conduct the usual regression modeling approach adjusting for the variables in which were included in the propensity model. Have your results changed substantially? NOTE: It might be helpful to use the “margins” command here.