Math 150, Spring 2023
Jo Hardin
WU # 19
Thursday, 4/6/23

Your Name: _____

Names of people you worked with: _____

1. What magical power would you like to have?
2. What happens in survival analysis if someone gets killed in a car accident (with death being the event of interest in the study)? Is the person considered dead or censored?
3. Consider the handout on hazard ratios for CHD (from the Framingham Study, Mahmood et al 2014, tables from Dupont 2009). Note that Dupont (throughout the text) refers to HR as instantaneous relative risk (which is why the tables say RR).
   (a) Table 7.3: does it seem like interaction is needed? Justify your response numerically.
   (b) Table 7.4: what does it mean to "adjust" for age, BMI, and serum cholesterol?

**Solution:**

2. If someone, for example, dies in a car accident while enrolled in a clinical trial (where the event of interest is death), the person is considered dead, not censored. The rationale is that dying of any cause is likely related to the underlying disease, so we don't try to parse out the death reason. In some trials a cause of death is assigned, and competing risks models used, but assigning cause can be dicey.

3. (a) Table 7.3: does it seem like interaction is needed? Justify your response numerically.

   For people with dbp 71-90 mm HG, the HR for men vs women is $5.55/2.43 = 3.04$

   For people with dbp $> 110$ mm HG, the HR for men vs women is $13/13.6 = 0.956$

   There is interaction because the level of dbp changes the relationship between sex and hazard of CHD.

3. (b) When we "adjust" for variables, that means the variables are included in the model. That is, coefficients are estimated for all of the additional variables (see equation (7.11)) on the handout. Note that when interpreting the HR, it is important to remember that you are **keeping all other variables constant**.