CPH 931 — Fall 2009 — Dr. Charnigo

Written Assignment 5 Solutions

1. First, the number 0.71 is not the odds ratio. The number 0.71 is the point estimate (single number best guess) of the odds ratio. Second, and more importantly, the summary results are so heavily rounded that we cannot tell whether statistical significance was attained. Has the p-value been rounded up to 0.05 (in which case statistical significance was attained) or rounded down to 0.05 (in which case statistical significance was not attained)? Has the upper endpoint of the 95% confidence interval been rounded up to 1.00 (in which case statistical significance was attained) or rounded down to 1.00 (in which case statistical significance was not attained)?

2. Noting that the subgroup analyses were "pre-defined" makes the authors less vulnerable to criticism that they conducted multiple hypothesis tests as part of a fishing expedition for statistically significant results.

3. No, the authors do not actually test the null hypothesis of no interaction between randomized therapy and the type of thrombectomy device available. Rather, the authors test separately the null hypothesis of no association between randomized therapy and mortality for patients in trials where manual thrombectomy devices were used and the null hypothesis of no association between randomized therapy and mortality for patients in trials where non-manual thrombectomy devices were used.

4. An unsophisticated reader might infer no clinically important relationship between randomized therapy and myocardial infarction based on the inclusion of the neutral value 1 in the 95% confidence interval for the odds ratio. However, the 95% confidence interval also includes some decidedly non-neutral values. For instance, the non-neutral value 0.5 corresponds to a 50% reduction in the odds of myocardial infarction, which if true would represent a clinically important relationship. This study simply does not resolve the question of whether thrombectomy reduces the risk of myocardial infarction.

5. Although a 7% reduction in the hazard of death may not be clinically important, presumably a 50% reduction in the hazard of death would be clinically important. Since 0.5 is in the 95% confidence interval for the hazard ratio, we cannot rule out a 50% reduction in the hazard of death. Therefore the authors' statement of no survival benefit is unwarranted. This study simply does not resolve the question of whether thrombectomy reduces the risk of death among patients not receiving IIb/IIIa inhibitors.

6. No, the results in Figure 2 are not based on a meta-analysis. Rather, the results in Figure 2 are based on combining the data from all trials into a single spreadsheet and then analyzing the contents of that spreadsheet as if they had emerged from a single trial.

7. The inclusion of Figure 3 makes the authors (somewhat) less vulnerable to criticism that their meta-analysis might have been susceptible to publication bias.