CPH 931 — Fall 2008 — Dr. Charnigo

Written Assignment 5

Written Assignment 5 is due on Tuesday 02 December at the end of lecture.

[85] 1. Refer to "Safety of carotid artery stenting for symptomatic carotid artery disease: a meta-analysis" by Gurm, Nallamothu, and Yadav (2008).

[10] a. In their abstract the authors state that "There was no difference in risk of 30-day mortality (summary RR 0.57, 95% CI 0.22-1.47, P = 0.25)." Explain why the authors would make such a statement, despite a point estimate suggesting that the risk of 30-day mortality is 43% lower with CAS than with CEA.

[15] b. Following up on item a, to which misunderstanding in Lecture 10A would an unsophisticated reader be vulnerable? How would you help such a reader overcome that misunderstanding?

[15] c. Regarding the outcome of 30-day mortality, how would you classify the meta-analysis itself (not the individual studies in the meta-analysis) in terms of the Lecture 10B nomenclature? State any assumptions that you make in performing this classification.

[15] d. Did the authors use a fixed-effects model, a random-effects model, or both? If both, for which model did they present results in their abstract and how did the results for the other model differ?

[15] e. The authors reported a heterogeneity p-value in Table 2 for each outcome but did not report the corresponding I^2. Therefore, please calculate the I^2 associated with each heterogeneity p-value in Table 2.

Hint #1: $I^2 = \max\{0, (\chi^2 - df)/\chi^2\}$, where df is one less than the number of individual studies contributing data. Note that the Wallstent study did not contribute data on four out of the five outcomes.

Hint #2: To obtain χ^2 from a p-value (e.g., 0.71) and the df (e.g., 3), you can use SAS code like the following.

```
data quantiles;
chisquare = cinv(1-.71,3);
run;
proc print;
run;
```

[15] f. Why do you suppose that the authors did not include funnel plots to diagnose publication bias? Do any specific statements or results in the manuscript affect your level of concern about publication bias?

[15] 2. The Excel file {Smoothing931F08.xls} has been constructed to implement moving average and kernel smoothing quantification of a temporal trend based on a bandwidth of 7 days and a 107-day monitoring period. [The file could be easily modified to accommodate a different bandwidth or monitoring period.]

Paste entries E162 to E268 from {SARS.xls} into cells B2 to B108 of {Smoothing931F08.xls}. Columns C and D will then display the temporal trends in SARS incidence as quantified by the moving average and kernel smoothing approaches. Prepare a graphic showing the raw data and the temporal trends; then comment on the results.

Hint: Highlight Columns B, C, and D. Click the Chart Wizard icon. Choose Line for the chart type.