hmrk 5

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Q1

Table 1: Hazard ratios and 95and bias analysis of unmeasured confounding for relationship between less-than-definitive therapy and breast cancer mortality.

Analysis	Systematic Error	Systematic Error and Random Error
Standard analysis	N/A	2.03 (1.18,3.49)
Bias analysis-Uniform	1.88 (1.60,2.06)	1.86 (1.07,3.27)
Bias analysis-Triangle	1.88 (1.62,2.05)	1.86 (1.07,3.26)

Q2

a.

- U Logistic Model (log odds):
  - Intercept: -0.56 (-0.87,-0.25)
  - defnther: 0.72 (0.2, 1.23)
- mortality-U relationship (HR):
  - Intercept: -0.56 (-0.87,-0.25)
  - defnther: 1.75 (1.01,3.05)

b.

Yes since the confounder is associated with both the exposure and the outcome. In this case the confounder is associated with the therapy status as seen in the non-null association in the logistic model and the confounder is associated with the outcome as seen in the non null HR between therapy status and cancer death.

Q3

The triangular priors has the narrower interval estimates. This makes sense since the triangular priors will concentrate more distributional mass in a region than uniform priors which would spread out the sampled prevalence more. As a result, the sampled prevalence from the triangular distributions are more concentrated together leading to the narrower intervals.

Q4

In initializing our PBA the prevalence of our unmeasured confounder was highest among those who died with less than definitive therapy. Our simulated confounder increased the hazard of dying from cancer.The original unadjusted model had a hazard ratio of 2.03 (1.18,3.49) while the bias corrected model had an adjusted hazard ratio of 1.86 (1.07,3.27). Thus the unmeasured confounder biased the effect of the lack of definitive therapy on cancer deaths away from the null.