9.5 A Statins and Mortality

Lindenauer et al.(Lindenauer et al 2004) reported that perioperative use of lipid-lowering agents may decrease mortality following cardiac surgery by about 30-40%. They controlled for confounding by creating a propensity score.

a.) Describe in words what the propensity score for this study was.

b.) Figure 1 from that paper (reprinted below) shows that mortality was lower among users of lipid-lowering drugs in all but the first quintile of propensity.
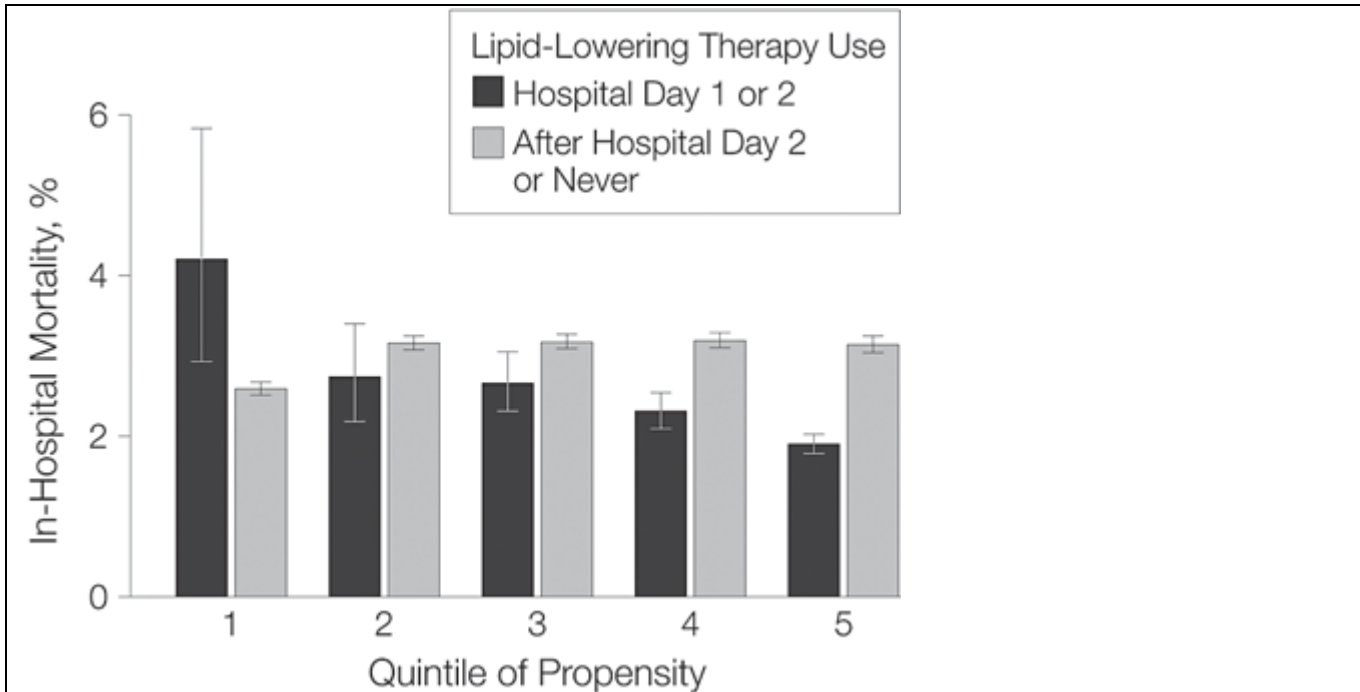
Figure 1. In-Hospital Mortality Associated With Lipid-Lowering Therapy in Propensity Based Quintiles

Error bars indicate 95% confidence intervals. Seventeen patients (0.002%) were excluded from multivariable analysis due to missing data; therefore, among 780 574 patients, mean lipid-lowering therapy use per quintile of propensity was 0.5% (quintile 1, n = 156 114), 1.9% (quintile 2, n = 156 115), 9.8% (quintile 3, n = 156 115), 10.9% (quintile 4, n = 156 115), and 31.3% (quintile 5, n = 156 115).

   i.) Why are the error bars for the mortality estimate for the left-most column of the graph so much longer than those for the other columns?

   ii.) It appears that for subjects in the lowest propensity quintile, use of lipid lowering drugs on hospital day 1 or 2 appeared to be harmful rather than beneficial. Assume for this question that there is no random error and no confounding -- i.e. that the results in the figure are accurate and causal. What implication does this have for promoting increased use of such drugs to reduce perioperative mortality after noncardiac surgery?

REFERENCES

Lindenauer, P. K., P. Pekow, et al. (2004). "Lipid-lowering therapy and in-hospital mortality following major noncardiac surgery." <u>Jama</u> **291**(17): 2092-9.