

Homework 1

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Please turn this in by Thursday, 1/12/17 by 5:00 pm.

Please submit on Canvas, in a compiled R-markdown file (to pdf or html).

Your writeup should be clearly written, and should integrate images, analysis and text. Think of this as a writeup that you are sending to a collaborator who provided the data.

Analysis Questions

- 1) The Eastern Cooperative Oncology Group (ECOG) has developed a scale (the ECOG performance status) to assess the progression of a patient's disease. In the nsclc data, **ECOG**, gives the ECOG score for each patient.
 - a) It seems reasonable to believe that increased ECOG score at baseline might decrease survival time. Please assess the degree to which this is the case (if at all) both graphically/intuitively and formally/numerically.
 - b) One might be interested in whether ECOG score modifies the effectiveness of treatment (eg. maybe treatment is only effective [over control] for ECOG=0, or it might be effective for everyone, but more effective for lower ECOG values, or perhaps the directionality is reversed). Please evaluate if this is the case — if ECOG does modify the effectiveness of treatment, please indicate how.
- 2) Additionally one may be interested in if age at onset is associated (potentially non-linearly) with survival outcome.
 - a) Please assess the degree of this association (/lack of association).
 - b) Does this association change between patients receiving the new treatment versus standard of care? What does this imply (if anything) about how age modifies the effectiveness of treatment? Can we use this to make age-based treatment decisions? (eg. something like “patients between 50 and 63 should receive the new treatment, while others should get the standard-of-care”)