

NRES 746, Week 8, Lecture 1: How Much Did the Prior Matter?

Name: _____

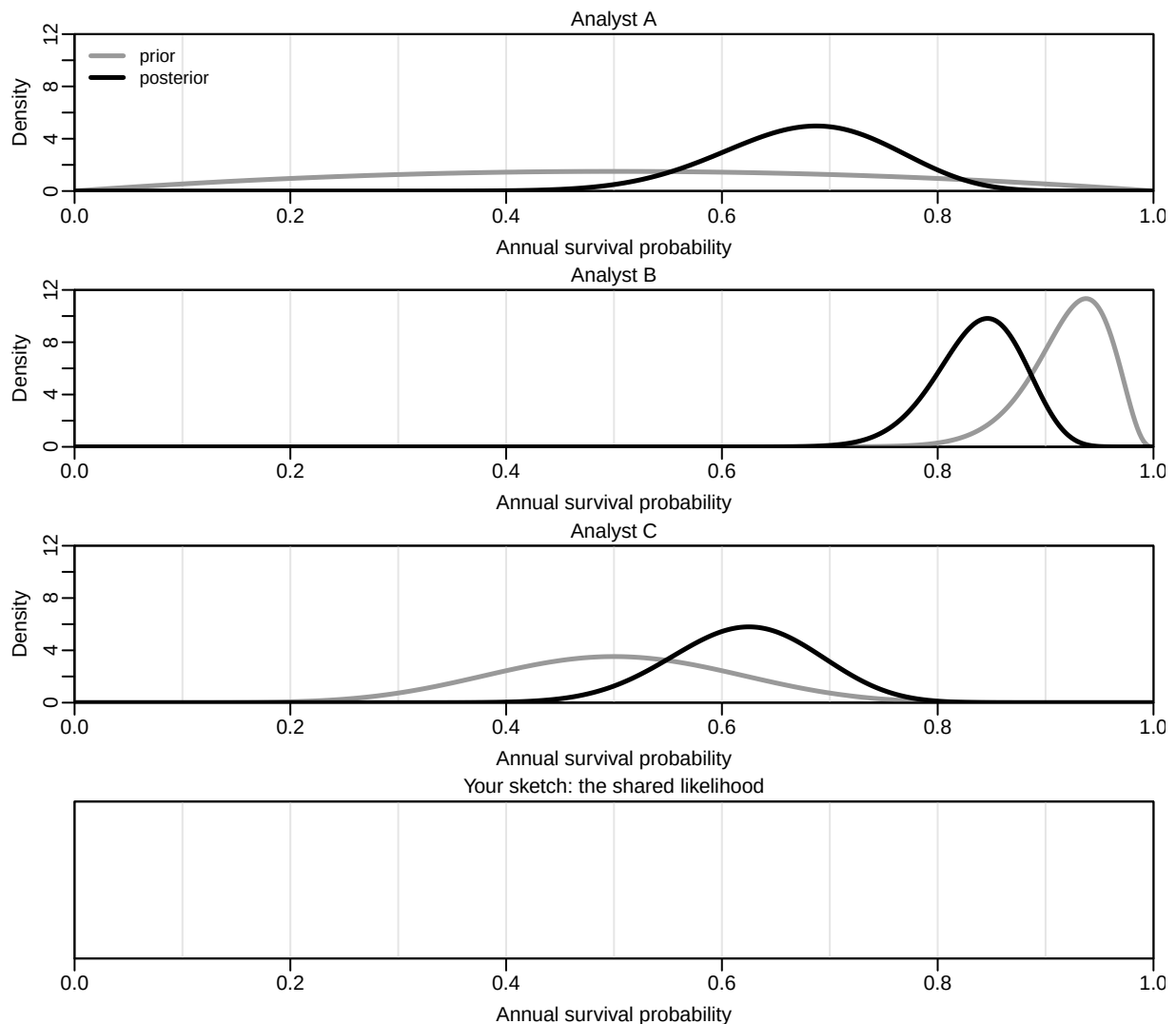
Instructions: Work alone on Part 1 (about 4 minutes), then compare with a neighbor for Part 2. Keep laptops closed.

The study

A biologist radio-tracks juvenile desert tortoises at one site and records which ones survive the year. Three analysts estimate annual survival from the **same data**, but each chooses a different prior:

- **Analyst A** uses a weak prior centered on 0.5.
- **Analyst B** uses earlier estimates from juveniles raised in a predator-proof pen.
- **Analyst C** uses an estimate from a severe drought year at another site.

Each panel shows one analyst's prior (grey) and posterior (black). The likelihood, which is the same in all three panels, is not shown.



Part 1: Find the likelihood (individual)

1a. Sketch the shared likelihood on the bottom panel (the height doesn't matter; get its peak and width roughly right). Which analyst's panel did you rely on most, and why?

1b. Rank the three analysts' results from most to least dependent on their choice of prior. Give a one-line reason for each.

Part 2: Which number? (with a neighbor)

2a. The three posterior means for annual survival are 0.68 (A), 0.84 (B), and 0.62 (C). A manager needs one survival rate for a population model. What would you tell them, and what would you report?
