

RESEARCH

Appendix: On Clinical Trial Fragility Due to Patients Lost to Follow Up

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Extended examples

In this section, we explore alternative visualizations of the three example clinical trials which result from alternative choices.

Effect size focused examples

We consider alternative visualizations of each clinical trial example in Section 3. Instead of the tile color displaying whether the augmented data (with the observed and lost patients) is statistically significant, the tile color now shows the effect size of the augmented data. The results are shown in Figure 1, Figure 2, and Figure 3.

Alternative prior choices

We explore the posterior distribution of the event counts among the lost patients $X_\ell | X_o$ when the conditional prior distribution $p_\ell | p_o$ in Equation 4 is chosen to be biased towards 0 or biased towards 1/2. We will see that these biases are reflected in the posterior distribution, because the conditional prior distribution fully controls the transfer of information from the observed patients to the lost patients.

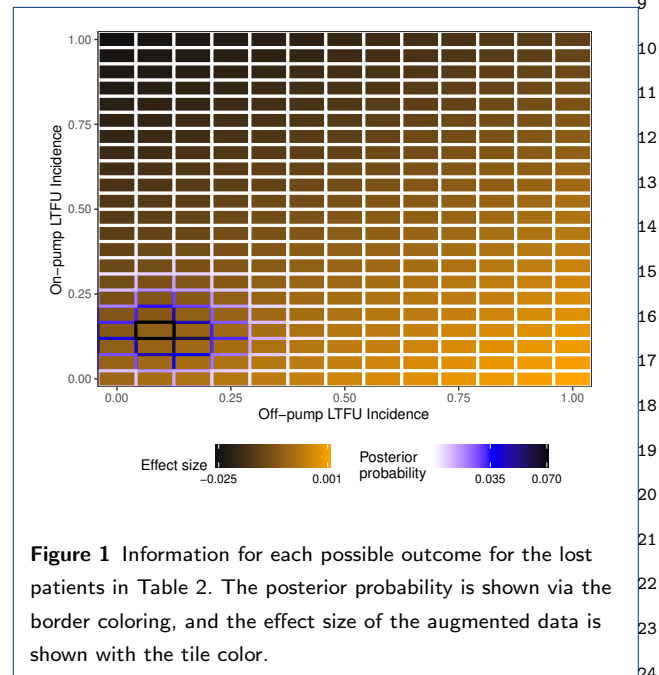
First, let us consider the former case and take

$$p_\ell | p_o \sim \text{Beta}(sp_o/2 + 1, s(1 - p_o/2) + 1).$$

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Note that this is the original definition of the conditional prior but with p_o replaced by $p_o/2$. The resulting figures for each of the three considered clinical trial examples is below. The results are shown in Figure 4, Figure 5, and Figure 6. In all cases, the the posterior distributions is biased towards 0 for both arms.

Second, let us consider the latter case and take

$$p_\ell | p_o \sim \text{Beta}(s(p_o/2 + 1/4) + 1, s(1 - (p_o/2 + 1/4)) + 1).$$

Note that this is the original definition of the conditional prior but with p_o replaced by $p_o/2 + 1/4$. The resulting figures for each of the three considered clinical trial examples is below. The results are shown in

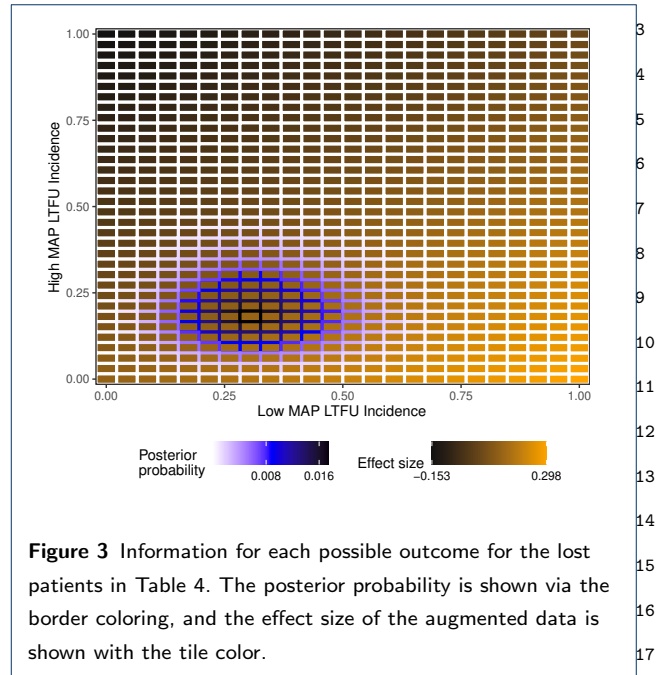
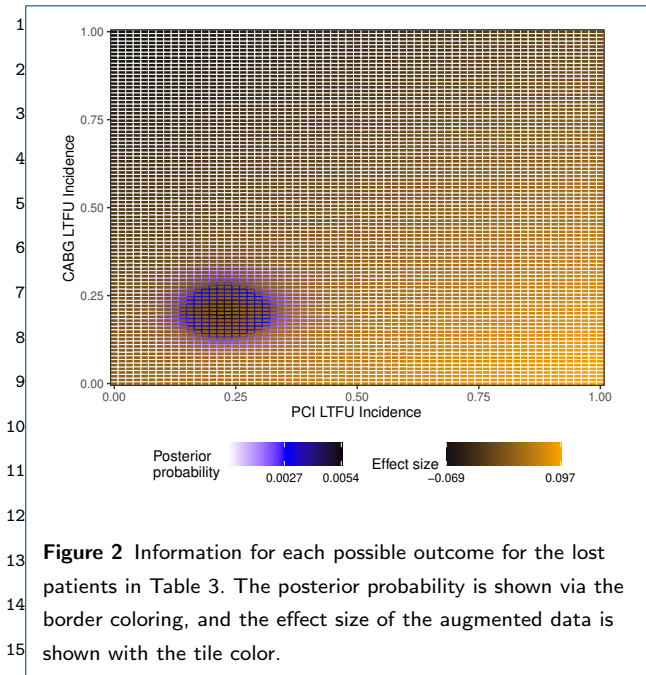
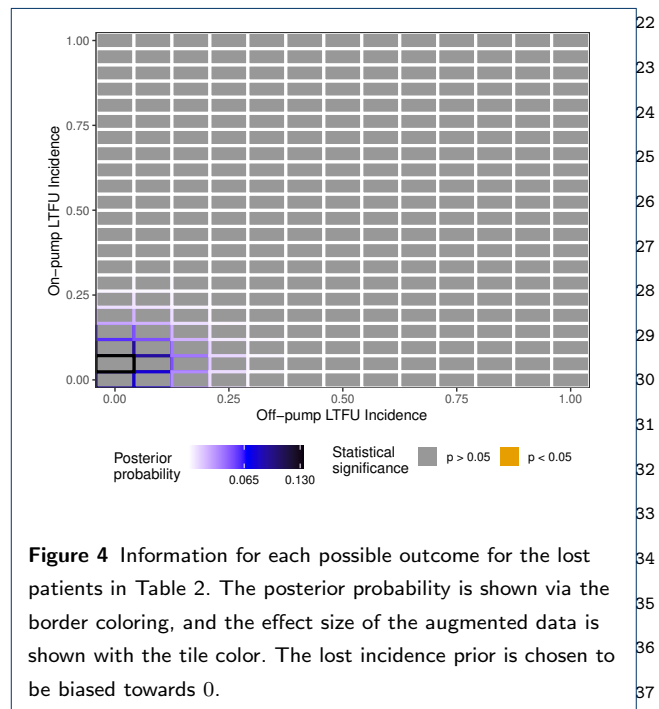


Figure 7, Figure 8, and Figure 9. In all cases, the the posterior distributions is biased towards 1/2 for both arms.

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References



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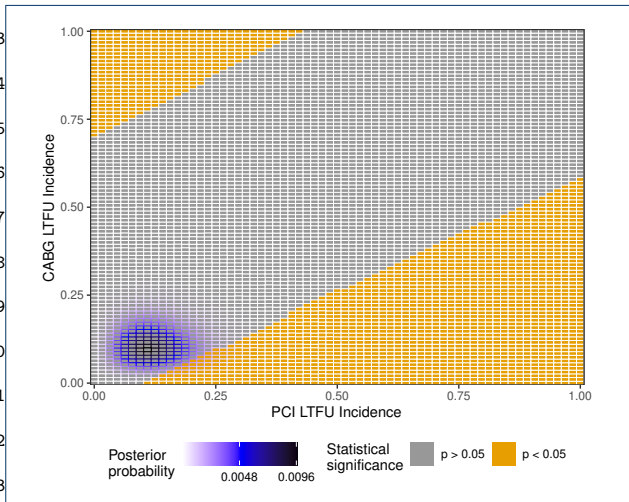


Figure 5 Information for each possible outcome for the lost patients in Table 3. The posterior probability is shown via the border coloring, and the effect size of the augmented data is shown with the tile color. The lost incidence prior is chosen to be biased towards 0.

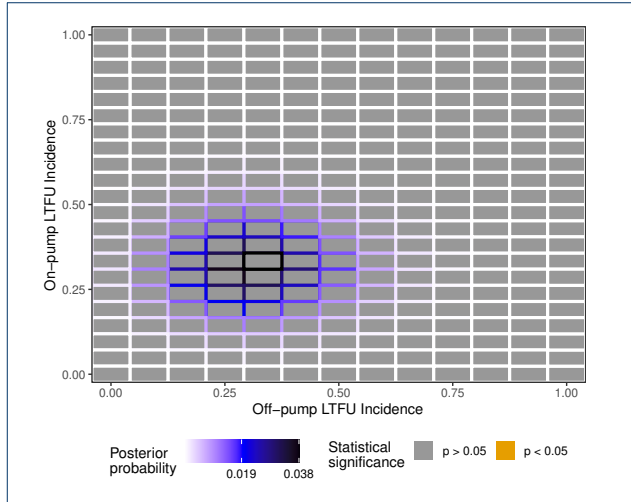


Figure 7 Information for each possible outcome for the lost patients in Table 2. The posterior probability is shown via the border coloring, and the effect size of the augmented data is shown with the tile color. The lost incidence prior is chosen to be biased towards 1/2.

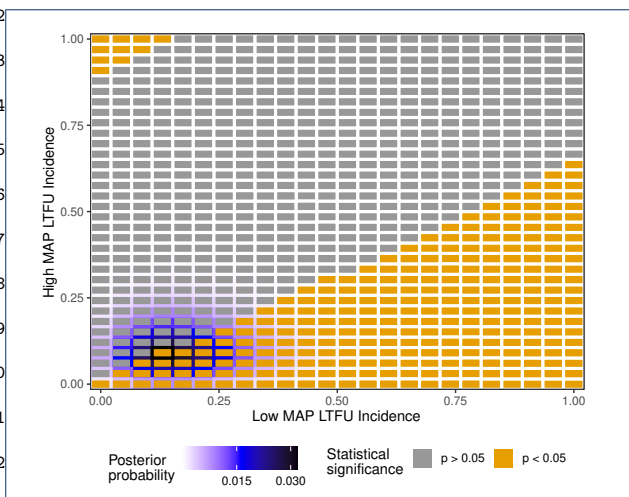


Figure 6 Information for each possible outcome for the lost patients in Table 4. The posterior probability is shown via the border coloring, and the effect size of the augmented data is shown with the tile color. The lost incidence prior is chosen to be biased towards 0.

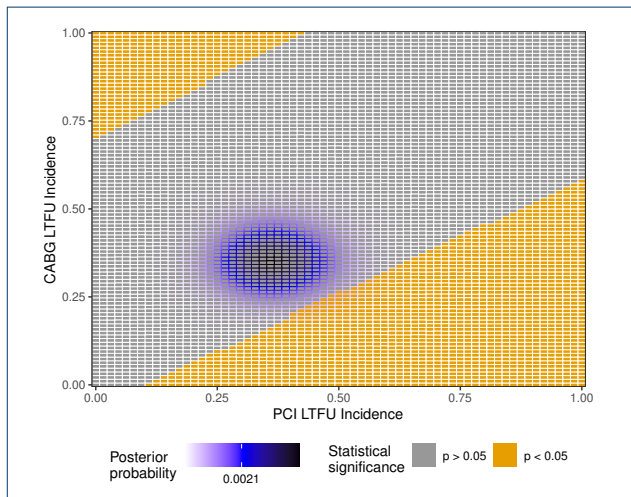


Figure 8 Information for each possible outcome for the lost patients in Table 3. The posterior probability is shown via the border coloring, and the effect size of the augmented data is shown with the tile color. The lost incidence prior is chosen to be biased towards 1/2.

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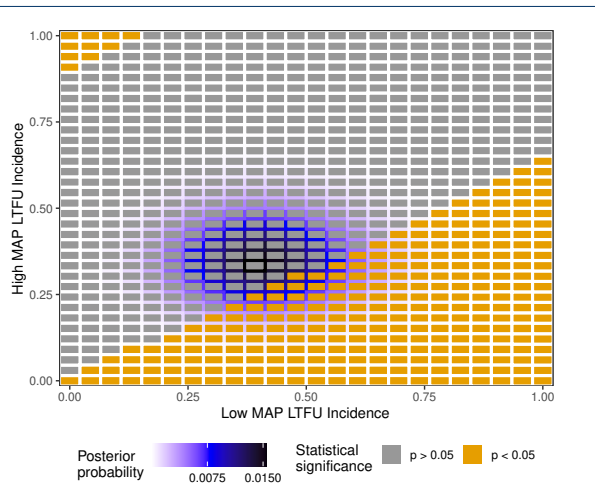


Figure 9 Information for each possible outcome for the lost patients in Table 4. The posterior probability is shown via the border coloring, and the effect size of the augmented data is shown with the tile color. The lost incidence prior is chosen to be biased towards 1/2.