Comments on SIM-23-0004 entitled " Identifying Critical Shortcomings of Estimators of Discriminative Performance in Time-to-Event Analyses: A Comparison Study"

This article studies the time-dependent AUC and concordance estimations for the right-censored data. Besides the semi- and non-parametric estimators of Incident/Dynamic AUC and the corresponding estimators of Concordance, authors also proposed smooth non-parametric and semi- parametric estimators for AUC and concordance. A simulation study and real data analysis are implemented for illustration. I have the following comments.

1. This article presents several different estimators for time-dependent AUC and concordance. But all use the same notations. For example, for the Incident/Dynamic AUC at time t, all use the same notation $AUC^{I/D}(t)$. It will make hard to read for the readers. Please set different notation for each estimator.

2. Page 2, line 38, it mentions that "semi-parametric estimators vastly overestimate the true out-of-sample predictive performance when underlying models overfit to the data." How to define the "true" out-of-sample predictive performance?

3. Please add more simulation studies. For example, consider non-Cox model to see the performance of estimators of discriminative.

4. Page 8, Line39, it indicates that in our simulation study, the penalized regression spline approach worked well for reducing variability, but resulted in slight bias. This is likely due to heteroskedasticity of the residual process and correlation of estimates for $AUC(t)$ along t which are not accounted for in classical additive models. It is not clear. Please discuss this in more detail.

5. Please give the conclusion about how to apply the results presented here to model selection in practice.