

Web supplementary for “Gene Set Analysis for time-to-event outcome with the Generalized Berk-Jones statistic”

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Summary

This document is the web supplementary for the article "Gene Set Analysis for time-to-event outcome with the Generalized Berk–Jones statistic". The first one presents the type-I error computed for the four compared methods: sGBJ, Global Boost Test, Global test, Wald test. The second supplementary shows the p-values of the four methods applied to breast cancer data.

KEYWORDS:

RNAseq, Gene Set Analysis, Generalized Berk-Jones, Glioma, Breast cancer

APPENDIX A: TYPE-I ERROR

We simulated the Case (I) and Case (III) presented Section 3 but with no significant genes to evaluate the type-I error on the four methods. Figure A1 shows that all four methods control the Type-I error.

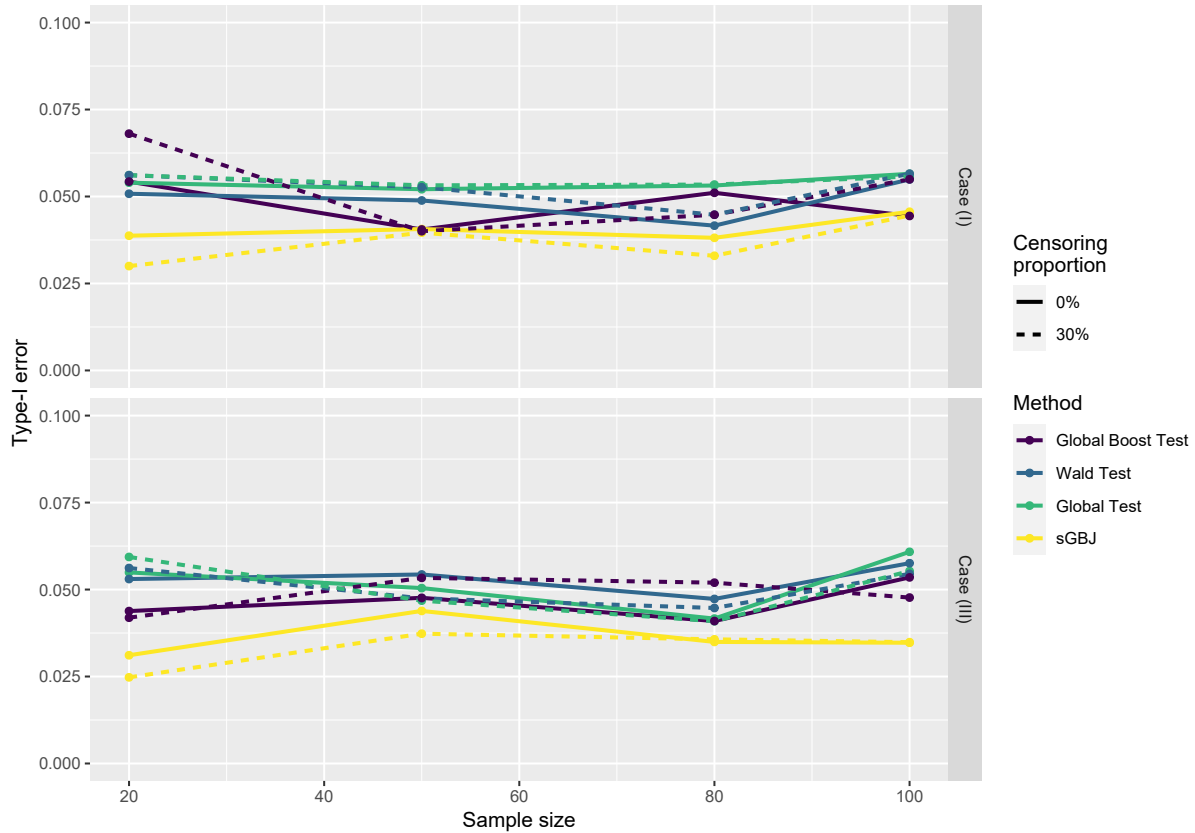


FIGURE A1 Type-I error computed for each method (sGBJ, Global Boost Test, Global test, Wald test) with increasing sample size, on the Cases (I) and (III) described Section 3, the Case (II) being identical to the Case (I) when there is no significant genes. Dotted lines represent a censoring fraction of 0.3; full lines, a censoring fraction of 0. The type-I error is the proportion of significant genes among the true negative.

APPENDIX B: COMPARISON OF SGBJ WITH OTHER METHODS FOR THE BREAST CANCER STUDY

As we did for the Rembrandt study, we evaluated the sGBJ method among global test, Wald test and global boost test. Figure B1 presents the raw p-values in function of the ranks of the p-values computed for sGBJ. The Benjamini Hochberg¹ limit shows the value a p-value must cross to be significant after multiple test correction, while the 5% threshold shows where the 0.05 p-value limit is. As we can see, a high number of pathways are found significant, and the four methods performs similarly, with a higher degree of precision for the low p-values with the sGBJ method.

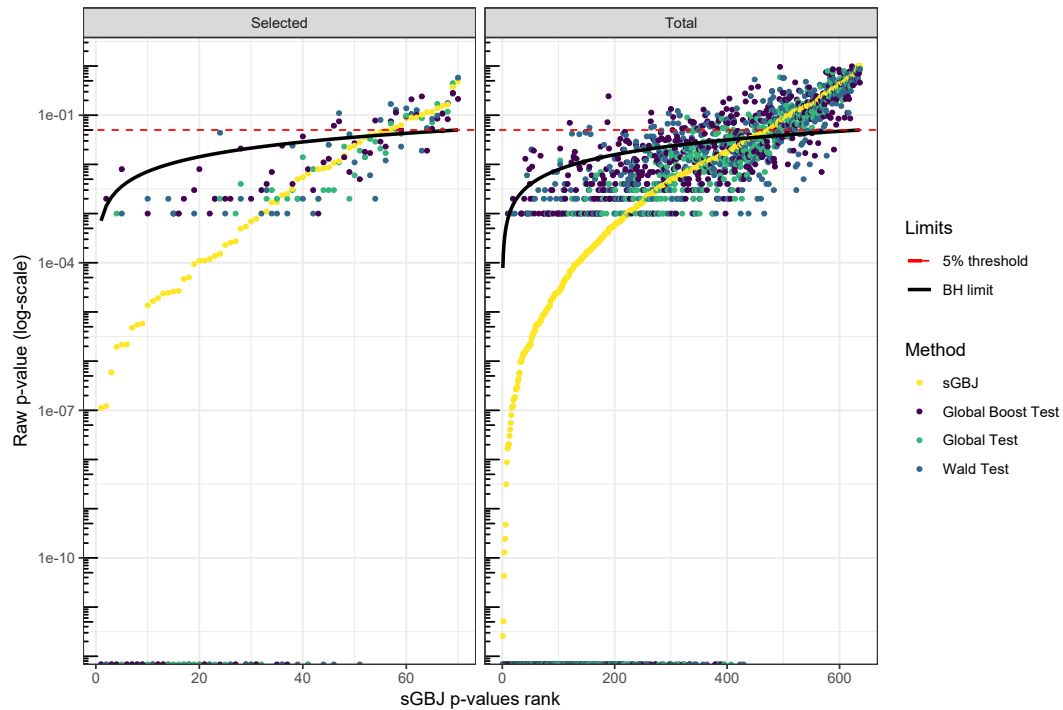


FIGURE B1 Raw p-values for the 4 methods, in function of the ranks of the p-values of sGBJ: sGBJ, global boost test, Wald test and global test, with the 5% threshold and the Benjamini Hochberg limit. *Nota Bene*: The Benjamini Hochberg limit only applies for the sGBJ method, as the ranks are computed for sGBJ only.

References

1. Benjamini Yoav, Hochberg Yosef. Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal statistical society: series B (Methodological)*. 1995;57(1):289–300.

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