

**Table S1 Results of rsf-VIF-res in scenarios Sim42 and Sim22\_1.0 for R=10000 and R=1000**

| Scenario  | <i>R</i> | IntScreen | IntSensiA | VarsTotal     | MainSensi      | IntSensi      | rIPEC          |                |
|-----------|----------|-----------|-----------|---------------|----------------|---------------|----------------|----------------|
|           |          |           |           |               |                |               | CoxBoostM      | Final Model    |
| Sim22_1.0 | 10000    | 15231.62  | 0.3       | 16.04 (14.72) | 0.29 (0.0454)  | 0.3 (0.0458)  | 0 (0.059)      | 0.103 (0.162)  |
|           | 1000     | 1597.9    | 0.02      | 11.58 (12.9)  | 0.31 (0.0462)  | 0.02 (0.014)  | -0.004 (0.063) | -0.007 (0.087) |
| Sim42     | 10000    | 25740.32  | 0.97      | 32.02 (6.56)  | 0.845 (0.0362) | 0.97 (0.0171) | 0.123 (0.122)  | 0.403 (0.116)  |
|           | 1000     | 2622.68   | 0.81      | 21.96 (8.29)  | 0.85 (0.0357)  | 0.81 (0.0392) | 0.123 (0.121)  | 0.39 (0.193)   |

Results are given in the form 'mean (sd)'. IntScreen is the number of selected interactions by the corresponding screening method, VarsTotal is the number of total variables in the final model, MainSensi is the sensitivity related to the inclusion of true main effects, IntSensiA is the sensitivity related to the availability of true interactions, and IntSensi is the sensitivity related to the inclusion of true interactions. The rIPEC values are given for the initial CoxBoost (CoxBoostM) and the final model.

Figure S1 Boxplots of rIPEC values in scenario Sim42 and Sim22\_1.0 for CoxBoostM and all strategies

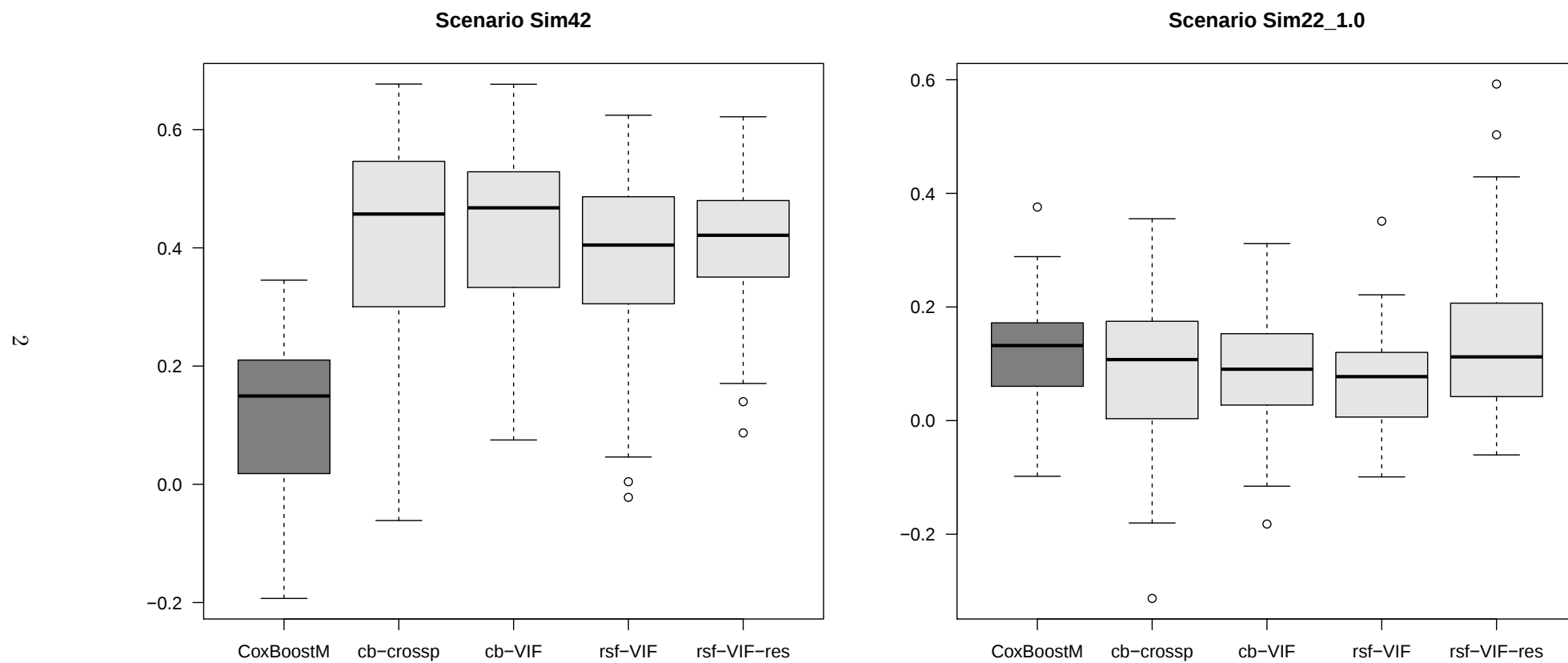


Figure S2 Boxplots of rIPEC values for CoxBoostM and rsf-VIF-res in scenarios Sim22\_0.25-Sim22\_2.5

