**Table S144.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *I*01 evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| ADELI versus WW | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus NDE | 1.17195E-12 | 1.15907E-12 | 1.00453E-12 |
| STLBO versus CWOA | 1.17195E-12 | 1.15907E-12 | 1.00453E-12 |
| TLBO versus PSO | 1.21236E-12 | 1.17240E-12 | 1.03917E-12 |
| STLBO versus GOTLBO | 1.21236E-12 | 1.17240E-12 | 1.03917E-12 |
| ADELI versus DE | 1.73772E-12 | 1.64224E-12 | 1.48948E-12 |
| STLBO versus DE | 1.83875E-12 | 1.71752E-12 | 1.57607E-12 |
| ADELI versus CWOA | 3.83915E-12 | 3.50164E-12 | 3.29070E-12 |
| EBLSHADE versus GOTLBO | 4.20286E-12 | 3.78719E-12 | 3.60245E-12 |
| STLBO versus NDE | 5.01110E-12 | 4.46043E-12 | 4.29523E-12 |
| ADELI versus GOTLBO | 5.41522E-12 | 4.76064E-12 | 4.64162E-12 |
| EBLSHADE versus CWOA | 5.98099E-12 | 5.19229E-12 | 5.12657E-12 |
| EBLSHADE versus ISCA | 1.17195E-11 | 1.00453E-11 | 1.00453E-11 |
| EBLSHADE versus DE | 1.45282E-11 | 1.22931E-11 | 1.06966E-11 |
| EBLSHADE versus NDE | 4.17053E-11 | 3.43725E-11 | 3.07061E-11 |
| STLBO versus ISCA | 8.17133E-11 | 6.64482E-11 | 6.01625E-11 |
| TLBO versus WW | 8.82197E-11 | 7.07696E-11 | 6.49529E-11 |
| TLBO versus MABC | 1.07900E-10 | 8.53717E-11 | 7.94431E-11 |
| EBLSHADE versus MABC | 3.09961E-10 | 2.38431E-10 | 2.28213E-10 |
| ADELI versus NNA | 3.24570E-10 | 2.46102E-10 | 2.38969E-10 |
| ADELI versus ISCA | 3.83410E-10 | 2.86504E-10 | 2.82291E-10 |
| STLBO versus MABC | 1.58351E-09 | 1.16588E-09 | 1.16588E-09 |
| STLBO versus NNA | 1.83408E-09 | 1.33021E-09 | 1.33021E-09 |
| TLBO versus ISCA | 3.49326E-09 | 2.49519E-09 | 2.22648E-09 |
| ADELI versus MABC | 5.83612E-09 | 4.10452E-09 | 3.71972E-09 |
| EBLSHADE versus NNA | 1.23520E-08 | 8.55140E-09 | 7.87272E-09 |
| EBLSHADE versus PSO | 1.47150E-08 | 1.00256E-08 | 9.37877E-09 |
| STLBO versus PSO | 5.32586E-08 | 3.57008E-08 | 3.39450E-08 |
| ADELI versus PSO | 1.50038E-07 | 9.89261E-08 | 9.56286E-08 |
| TLBO versus GOTLBO | 2.16253E-07 | 1.40208E-07 | 1.37831E-07 |
| EBLSHADE versus WW | 2.39169E-07 | 1.52438E-07 | 1.52438E-07 |
| TLBO versus CWOA | 2.89034E-07 | 1.81043E-07 | 1.77867E-07 |
| TLBO versus DE | 5.91345E-07 | 3.63905E-07 | 3.63905E-07 |
| STLBO versus WW | 6.86296E-07 | 4.14794E-07 | 4.14794E-07 |
| TLBO versus NDE | 1.37158E-06 | 8.13904E-07 | 7.68687E-07 |
| TLBO versus NNA | 1.17758E-04 | 6.72904E-05 | 6.59964E-05 |
| NNA versus WW | 2.21281E-02 | 1.24015E-02 | 1.24015E-02 |
| IJAYA versus WW | 2.36193E-01 | 1.29777E-01 | 1.24585E-01 |
| NNA versus PSO | 2.36193E-01 | 1.29777E-01 | 1.24585E-01 |
| NDE versus WW | 4.04596E-01 | 2.13413E-01 | 2.13413E-01 |
| DE versus WW | 6.28685E-01 | 3.24706E-01 | 3.24706E-01 |
| CWOA versus WW | 8.94683E-01 | 4.52257E-01 | 4.52257E-01 |
| GOTLBO versus WW | 1.0 | 5.07626E-01 | 5.07626E-01 |
| IJAYA versus PSO | 1.0 | 8.15876E-01 | 7.97333E-01 |
| NNA versus MABC | 1.0 | 9.64793E-01 | 9.64793E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus PSO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| DE versus ISCA | 1.0 | 1.0 | 1.0 |
| DE versus NNA | 1.0 | 1.0 | 1.0 |
| DE versus CWOA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus MABC | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus PSO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus ISCA | 1.0 | 1.0 | 1.0 |
| NDE versus NNA | 1.0 | 1.0 | 1.0 |
| NDE versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus GOTLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus PSO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus MABC | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus ISCA | 1.0 | 1.0 | 1.0 |
| IJAYA versus NNA | 1.0 | 1.0 | 1.0 |
| IJAYA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus PSO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S145.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *n*1 evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| EBLSHADE versus CWOA | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus PSO | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus NNA | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus CWOA | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus CWOA | <1E-13 | <1E-13 | <1E-13 |
| TLBO versus ISCA | 1.61648E-12 | 1.52767E-12 | 1.38556E-12 |
| EBLSHADE versus MABC | 2.99050E-12 | 2.79332E-12 | 2.56328E-12 |
| STLBO versus MABC | 1.78622E-11 | 1.64881E-11 | 1.53104E-11 |
| TLBO versus GOTLBO | 2.46918E-11 | 2.25211E-11 | 2.11644E-11 |
| EBLSHADE versus GOTLBO | 5.12426E-11 | 4.61746E-11 | 4.39222E-11 |
| ADELI versus MABC | 7.56515E-11 | 6.73381E-11 | 6.48441E-11 |
| TLBO versus WW | 2.00969E-10 | 1.76676E-10 | 1.72260E-10 |
| STLBO versus GOTLBO | 2.49909E-10 | 2.16954E-10 | 2.14207E-10 |
| TLBO versus MABC | 4.53444E-10 | 3.88666E-10 | 3.88666E-10 |
| EBLSHADE versus ISCA | 5.43381E-10 | 4.59784E-10 | 4.00072E-10 |
| ADELI versus GOTLBO | 8.75044E-10 | 7.30806E-10 | 6.44263E-10 |
| TLBO versus PSO | 1.00018E-09 | 8.24324E-10 | 7.36396E-10 |
| TLBO versus NNA | 2.04728E-09 | 1.66482E-09 | 1.50734E-09 |
| STLBO versus ISCA | 2.18167E-09 | 1.75013E-09 | 1.60628E-09 |
| ADELI versus ISCA | 6.57190E-09 | 5.19974E-09 | 4.83865E-09 |
| NDE versus CWOA | 3.36109E-08 | 2.62239E-08 | 2.47465E-08 |
| TLBO versus CWOA | 5.32586E-08 | 4.09682E-08 | 3.92124E-08 |
| EBLSHADE versus WW | 5.60533E-08 | 4.25019E-08 | 4.12700E-08 |
| STLBO versus WW | 1.57318E-07 | 1.17556E-07 | 1.15828E-07 |
| EBLSHADE versus PSO | 1.72868E-07 | 1.27276E-07 | 1.27276E-07 |
| EBLSHADE versus NNA | 2.86887E-07 | 2.08072E-07 | 2.08072E-07 |
| ADELI versus DE | 3.33882E-07 | 2.34818E-07 | 2.12804E-07 |
| ADELI versus WW | 3.58848E-07 | 2.48433E-07 | 2.28717E-07 |
| STLBO versus PSO | 4.47114E-07 | 3.04627E-07 | 2.84974E-07 |
| STLBO versus NNA | 7.15762E-07 | 4.79796E-07 | 4.56200E-07 |
| STLBO versus DE | 1.19373E-06 | 7.73959E-07 | 7.60841E-07 |
| NDE versus NNA | 2.07377E-06 | 1.32174E-06 | 1.32174E-06 |
| NDE versus PSO | 4.36970E-06 | 2.73706E-06 | 2.68905E-06 |
| EBLSHADE versus DE | 4.99510E-06 | 3.01902E-06 | 3.01902E-06 |
| DE versus CWOA | 6.39569E-06 | 3.79524E-06 | 3.58440E-06 |
| IJAYA versus CWOA | 7.30359E-06 | 4.25374E-06 | 4.09322E-06 |
| NDE versus WW | 1.94193E-05 | 1.10967E-05 | 1.08833E-05 |
| ADELI versus NDE | 4.70344E-05 | 2.63600E-05 | 2.63600E-05 |
| STLBO versus NDE | 1.40958E-04 | 7.74492E-05 | 7.43513E-05 |
| DE versus NNA | 2.26316E-04 | 1.21862E-04 | 1.19375E-04 |
| IJAYA versus NNA | 2.54404E-04 | 1.34191E-04 | 1.34191E-04 |
| DE versus PSO | 4.27764E-04 | 2.20933E-04 | 2.20933E-04 |
| EBLSHADE versus NDE | 4.79400E-04 | 2.42334E-04 | 2.42334E-04 |
| IJAYA versus PSO | 4.79400E-04 | 2.42334E-04 | 2.42334E-04 |
| TLBO versus DE | 1.30442E-03 | 6.16374E-04 | 6.16374E-04 |
| DE versus WW | 1.53460E-03 | 7.08277E-04 | 7.08277E-04 |
| IJAYA versus WW | 1.70903E-03 | 7.70003E-04 | 7.51222E-04 |
| NDE versus ISCA | 1.90225E-03 | 8.36152E-04 | 8.36152E-04 |
| NDE versus GOTLBO | 9.80133E-03 | 4.20057E-03 | 4.20057E-03 |
| NDE versus MABC | 4.80428E-02 | 2.00618E-02 | 2.00618E-02 |
| TLBO versus NDE | 5.02234E-02 | 2.04205E-02 | 2.04205E-02 |
| DE versus ISCA | 6.82680E-02 | 2.70071E-02 | 2.70071E-02 |
| IJAYA versus ISCA | 7.44356E-02 | 2.86291E-02 | 2.86291E-02 |
| DE versus GOTLBO | 2.55477E-01 | 9.54529E-02 | 9.54529E-02 |
| IJAYA versus GOTLBO | 2.76188E-01 | 1.00156E-01 | 9.71211E-02 |
| MABC versus CWOA | 4.52529E-01 | 1.59131E-01 | 1.59131E-01 |
| DE versus MABC | 8.94683E-01 | 3.04782E-01 | 3.04782E-01 |
| IJAYA versus MABC | 9.58593E-01 | 3.16020E-01 | 3.16020E-01 |
| GOTLBO versus CWOA | 1.0 | 4.72336E-01 | 4.72336E-01 |
| MABC versus NNA | 1.0 | 9.34584E-01 | 9.34584E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus GOTLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus PSO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus PSO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S146.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *R*p1 evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| EBLSHADE versus GOTLBO | <1E-13 | <1E-13 | <1E-13 |
| EBLSHADE versus PSO | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus GOTLBO | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus PSO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus GOTLBO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus PSO | <1E-13 | <1E-13 | <1E-13 |
| TLBO versus WW | 1.43463E-12 | 1.34004E-12 | 1.22968E-12 |
| ADELI versus MABC | 1.33360E-11 | 1.23102E-11 | 1.14309E-11 |
| STLBO versus MABC | 2.69549E-11 | 2.45852E-11 | 2.31042E-11 |
| EBLSHADE versus MABC | 3.50373E-11 | 3.15721E-11 | 3.00320E-11 |
| TLBO versus CWOA | 4.11355E-10 | 3.66151E-10 | 3.52590E-10 |
| TLBO versus NNA | 8.18143E-10 | 7.19247E-10 | 7.01266E-10 |
| TLBO versus ISCA | 1.06888E-09 | 9.27929E-10 | 9.16183E-10 |
| EBLSHADE versus WW | 2.63616E-09 | 2.25957E-09 | 2.25957E-09 |
| STLBO versus WW | 3.17823E-09 | 2.68927E-09 | 2.34002E-09 |
| TLBO versus PSO | 4.31959E-09 | 3.60757E-09 | 3.18036E-09 |
| ADELI versus WW | 5.17792E-09 | 4.26752E-09 | 3.81232E-09 |
| TLBO versus GOTLBO | 1.10887E-08 | 9.01722E-09 | 8.16424E-09 |
| NDE versus GOTLBO | 8.94170E-08 | 7.17301E-08 | 6.58345E-08 |
| ADELI versus DE | 1.61452E-07 | 1.27742E-07 | 1.18871E-07 |
| EBLSHADE versus CWOA | 2.62028E-07 | 2.04440E-07 | 1.92922E-07 |
| NDE versus PSO | 2.89034E-07 | 2.22334E-07 | 2.12805E-07 |
| STLBO versus DE | 2.89034E-07 | 2.22334E-07 | 2.12805E-07 |
| STLBO versus CWOA | 3.00115E-07 | 2.22334E-07 | 2.20964E-07 |
| TLBO versus MABC | 3.10670E-07 | 2.25321E-07 | 2.25321E-07 |
| EBLSHADE versus DE | 3.58779E-07 | 2.56271E-07 | 2.28673E-07 |
| EBLSHADE versus NNA | 4.09653E-07 | 2.88108E-07 | 2.61097E-07 |
| ADELI versus CWOA | 4.28007E-07 | 2.96312E-07 | 2.72795E-07 |
| STLBO versus NNA | 4.67004E-07 | 3.18178E-07 | 2.97651E-07 |
| EBLSHADE versus ISCA | 4.87704E-07 | 3.26922E-07 | 3.10844E-07 |
| STLBO versus ISCA | 5.54974E-07 | 3.59818E-07 | 3.53720E-07 |
| ADELI versus NNA | 6.57947E-07 | 4.12121E-07 | 4.04891E-07 |
| ADELI versus ISCA | 7.78206E-07 | 4.78896E-07 | 4.78896E-07 |
| NDE versus ISCA | 1.37158E-06 | 8.28976E-07 | 8.28976E-07 |
| NDE versus NNA | 1.80779E-06 | 1.07275E-06 | 1.01315E-06 |
| NDE versus CWOA | 3.57169E-06 | 2.08021E-06 | 2.00172E-06 |
| IJAYA versus GOTLBO | 6.81498E-05 | 3.89427E-05 | 3.81938E-05 |
| DE versus GOTLBO | 1.10876E-04 | 6.21395E-05 | 6.21395E-05 |
| IJAYA versus PSO | 1.78805E-04 | 9.82446E-05 | 9.43149E-05 |
| ADELI versus NDE | 1.78805E-04 | 9.82446E-05 | 9.43149E-05 |
| DE versus PSO | 2.85820E-04 | 1.50762E-04 | 1.50762E-04 |
| STLBO versus NDE | 2.85820E-04 | 1.50762E-04 | 1.50762E-04 |
| EBLSHADE versus NDE | 3.40016E-04 | 1.71876E-04 | 1.71876E-04 |
| TLBO versus DE | 5.36975E-04 | 2.65537E-04 | 2.65537E-04 |
| IJAYA versus ISCA | 6.35902E-04 | 3.07469E-04 | 3.00481E-04 |
| NDE versus WW | 7.11295E-04 | 3.36107E-04 | 3.36107E-04 |
| IJAYA versus NNA | 7.95190E-04 | 3.67011E-04 | 3.67011E-04 |
| DE versus ISCA | 9.92197E-04 | 4.36131E-04 | 4.36131E-04 |
| DE versus NNA | 1.23530E-03 | 5.29414E-04 | 5.29414E-04 |
| IJAYA versus CWOA | 1.37722E-03 | 5.75102E-04 | 5.75102E-04 |
| DE versus CWOA | 2.11615E-03 | 8.60411E-04 | 8.60411E-04 |
| MABC versus GOTLBO | 4.80428E-02 | 1.90060E-02 | 1.90060E-02 |
| IJAYA versus WW | 8.83504E-02 | 3.39809E-02 | 3.39809E-02 |
| MABC versus PSO | 9.61775E-02 | 3.59344E-02 | 3.59344E-02 |
| TLBO versus NDE | 1.00327E-01 | 3.63824E-02 | 3.59344E-02 |
| DE versus WW | 1.23672E-01 | 4.34891E-02 | 4.34891E-02 |
| MABC versus ISCA | 2.36193E-01 | 8.04614E-02 | 8.04614E-02 |
| MABC versus NNA | 2.76188E-01 | 9.10511E-02 | 9.10511E-02 |
| MABC versus CWOA | 4.04596E-01 | 1.28937E-01 | 1.28937E-01 |
| NDE versus MABC | 7.25121E-01 | 2.23114E-01 | 2.23114E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus MABC | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus PSO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S147.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *I*02 evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| ADELI versus PSO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus PSO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus GOTLBO | 1.43463E-12 | 1.40310E-12 | 1.22968E-12 |
| STLBO versus ISCA | 1.43463E-12 | 1.40310E-12 | 1.22968E-12 |
| STLBO versus MABC | 1.61648E-12 | 1.54543E-12 | 1.38556E-12 |
| ADELI versus MABC | 1.85896E-12 | 1.75682E-12 | 1.59339E-12 |
| STLBO versus NNA | 2.14184E-12 | 2.00062E-12 | 1.83586E-12 |
| ADELI versus GOTLBO | 2.16205E-12 | 2.00062E-12 | 1.85318E-12 |
| ADELI versus ISCA | 2.16205E-12 | 2.00062E-12 | 1.85318E-12 |
| EBLSHADE versus CWOA | 2.18225E-12 | 2.00062E-12 | 1.87050E-12 |
| STLBO versus WW | 2.30349E-12 | 2.05036E-12 | 1.97442E-12 |
| EBLSHADE versus WW | 2.50555E-12 | 2.20268E-12 | 2.14762E-12 |
| EBLSHADE versus NNA | 2.74802E-12 | 2.38565E-12 | 2.35545E-12 |
| EBLSHADE versus DE | 9.09273E-12 | 7.69385E-12 | 6.69464E-12 |
| ADELI versus NNA | 1.17195E-11 | 9.78773E-12 | 8.62865E-12 |
| ADELI versus WW | 1.27702E-11 | 1.05249E-11 | 9.40226E-12 |
| EBLSHADE versus GOTLBO | 1.59022E-11 | 1.29314E-11 | 1.17082E-11 |
| EBLSHADE versus ISCA | 1.59022E-11 | 1.29314E-11 | 1.17082E-11 |
| EBLSHADE versus MABC | 1.89533E-11 | 1.49960E-11 | 1.39546E-11 |
| STLBO versus CWOA | 2.48535E-11 | 1.93912E-11 | 1.82987E-11 |
| STLBO versus DE | 9.52514E-11 | 7.22236E-11 | 7.01301E-11 |
| ADELI versus CWOA | 1.19539E-10 | 8.93259E-11 | 8.80123E-11 |
| ADELI versus DE | 4.11355E-10 | 2.93825E-10 | 2.78092E-10 |
| TLBO versus PSO | 3.83430E-10 | 2.78092E-10 | 2.78092E-10 |
| ADELI versus NDE | 1.03645E-09 | 7.28932E-10 | 6.60594E-10 |
| STLBO versus NDE | 5.20274E-09 | 3.60189E-09 | 3.31603E-09 |
| TLBO versus DE | 5.63195E-09 | 3.83716E-09 | 3.58960E-09 |
| TLBO versus CWOA | 2.12347E-08 | 1.40009E-08 | 1.35342E-08 |
| EBLSHADE versus NDE | 4.90997E-08 | 3.18339E-08 | 3.12943E-08 |
| TLBO versus WW | 1.73724E-07 | 1.10725E-07 | 1.10725E-07 |
| TLBO versus NNA | 1.86904E-07 | 1.17072E-07 | 1.15018E-07 |
| EBLSHADE versus PSO | 6.57947E-07 | 4.04891E-07 | 4.04891E-07 |
| TLBO versus GOTLBO | 7.84454E-07 | 4.74120E-07 | 4.74120E-07 |
| TLBO versus ISCA | 7.84454E-07 | 4.74120E-07 | 4.74120E-07 |
| TLBO versus MABC | 9.02777E-07 | 5.25793E-07 | 5.05952E-07 |
| TLBO versus NDE | 4.03987E-04 | 2.30850E-04 | 2.26410E-04 |
| NDE versus PSO | 2.90375E-03 | 1.62737E-03 | 1.62737E-03 |
| MABC versus PSO | 2.36193E-01 | 1.29777E-01 | 1.24585E-01 |
| GOTLBO versus PSO | 2.55477E-01 | 1.37564E-01 | 1.34757E-01 |
| ISCA versus PSO | 2.55477E-01 | 1.37564E-01 | 1.34757E-01 |
| NNA versus PSO | 5.43931E-01 | 2.80932E-01 | 2.80932E-01 |
| WW versus PSO | 5.64095E-01 | 2.85147E-01 | 2.85147E-01 |
| CWOA versus PSO | 1.0 | 7.32936E-01 | 7.32936E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus PSO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| DE versus ISCA | 1.0 | 1.0 | 1.0 |
| DE versus NNA | 1.0 | 1.0 | 1.0 |
| DE versus CWOA | 1.0 | 1.0 | 1.0 |
| DE versus WW | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus MABC | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus ISCA | 1.0 | 1.0 | 1.0 |
| NDE versus NNA | 1.0 | 1.0 | 1.0 |
| NDE versus CWOA | 1.0 | 1.0 | 1.0 |
| NDE versus WW | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus GOTLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus MABC | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus PSO | 1.0 | 1.0 | 1.0 |
| IJAYA versus ISCA | 1.0 | 1.0 | 1.0 |
| IJAYA versus NNA | 1.0 | 1.0 | 1.0 |
| IJAYA versus CWOA | 1.0 | 1.0 | 1.0 |
| IJAYA versus WW | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S148.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *n*2 evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| EBLSHADE versus PSO | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus PSO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus PSO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus ISCA | 1.73772E-12 | 1.68043E-12 | 1.48948E-12 |
| EBLSHADE versus ISCA | 2.50555E-12 | 2.39542E-12 | 2.14762E-12 |
| ADELI versus ISCA | 5.90017E-12 | 5.57598E-12 | 5.05729E-12 |
| TLBO versus GOTLBO | 3.82299E-11 | 3.57092E-11 | 3.27685E-11 |
| TLBO versus NNA | 5.54050E-11 | 5.11431E-11 | 4.74900E-11 |
| STLBO versus GOTLBO | 2.88583E-10 | 2.63213E-10 | 2.47357E-10 |
| TLBO versus CWOA | 3.57304E-10 | 3.21966E-10 | 3.06260E-10 |
| EBLSHADE versus GOTLBO | 4.11355E-10 | 3.66151E-10 | 3.52590E-10 |
| NDE versus PSO | 4.17134E-10 | 3.66711E-10 | 3.57543E-10 |
| ADELI versus MABC | 4.53444E-10 | 3.93649E-10 | 3.88666E-10 |
| ADELI versus GOTLBO | 8.18143E-10 | 7.01266E-10 | 7.01266E-10 |
| EBLSHADE versus MABC | 1.03645E-09 | 8.76996E-10 | 7.63100E-10 |
| STLBO versus MABC | 1.55916E-09 | 1.30216E-09 | 1.14795E-09 |
| NDE versus WW | 1.58351E-09 | 1.30509E-09 | 1.16588E-09 |
| DE versus WW | 2.74625E-09 | 2.23321E-09 | 2.02196E-09 |
| IJAYA versus WW | 5.20274E-09 | 4.17362E-09 | 3.83059E-09 |
| TLBO versus PSO | 7.39368E-09 | 5.84994E-09 | 5.44370E-09 |
| TLBO versus ISCA | 7.72300E-09 | 6.02564E-09 | 5.68616E-09 |
| TLBO versus WW | 1.48718E-08 | 1.12764E-08 | 1.09496E-08 |
| NDE versus CWOA | 1.82015E-08 | 1.36011E-08 | 1.34011E-08 |
| ADELI versus DE | 2.47603E-08 | 1.82301E-08 | 1.82301E-08 |
| EBLSHADE versus DE | 5.29450E-08 | 3.72360E-08 | 3.37451E-08 |
| STLBO versus DE | 7.70341E-08 | 5.33313E-08 | 4.90986E-08 |
| STLBO versus NNA | 9.71903E-08 | 6.62176E-08 | 6.19455E-08 |
| NDE versus NNA | 1.20281E-07 | 8.06279E-08 | 7.66626E-08 |
| EBLSHADE versus NNA | 1.23921E-07 | 8.17061E-08 | 7.89826E-08 |
| MABC versus WW | 1.29493E-07 | 8.39569E-08 | 8.25339E-08 |
| ADELI versus NNA | 1.98870E-07 | 1.26753E-07 | 1.26753E-07 |
| STLBO versus CWOA | 3.13904E-07 | 1.96621E-07 | 1.93172E-07 |
| STLBO versus WW | 3.76647E-07 | 2.31783E-07 | 2.31783E-07 |
| EBLSHADE versus CWOA | 3.92026E-07 | 2.36939E-07 | 2.36939E-07 |
| EBLSHADE versus WW | 4.21156E-07 | 2.49917E-07 | 2.36939E-07 |
| ADELI versus WW | 5.24150E-07 | 3.05274E-07 | 2.93755E-07 |
| ADELI versus CWOA | 6.04449E-07 | 3.45400E-07 | 3.38757E-07 |
| TLBO versus MABC | 1.01533E-05 | 5.69029E-06 | 5.69029E-06 |
| NDE versus GOTLBO | 8.70224E-05 | 4.78145E-05 | 4.59019E-05 |
| ISCA versus WW | 1.04382E-04 | 5.62059E-05 | 5.50588E-05 |
| TLBO versus DE | 2.26316E-04 | 1.16888E-04 | 1.16888E-04 |
| DE versus PSO | 4.03987E-04 | 2.04213E-04 | 2.04213E-04 |
| IJAYA versus PSO | 6.35902E-04 | 3.14457E-04 | 3.14457E-04 |
| NDE versus ISCA | 3.22321E-03 | 1.55847E-03 | 1.52305E-03 |
| GOTLBO versus WW | 3.76564E-03 | 1.77937E-03 | 1.77937E-03 |
| DE versus CWOA | 5.12081E-03 | 2.36345E-03 | 2.36345E-03 |
| MABC versus PSO | 5.96060E-03 | 2.68554E-03 | 2.62004E-03 |
| ADELI versus NDE | 6.26838E-03 | 2.75533E-03 | 2.75533E-03 |
| IJAYA versus CWOA | 7.65642E-03 | 3.28132E-03 | 3.28132E-03 |
| EBLSHADE versus NDE | 1.02934E-02 | 4.29835E-03 | 4.29835E-03 |
| STLBO versus NDE | 1.31235E-02 | 5.33592E-03 | 5.33592E-03 |
| DE versus NNA | 1.74861E-02 | 6.91757E-03 | 6.91757E-03 |
| IJAYA versus NNA | 2.54443E-02 | 9.78628E-03 | 9.78628E-03 |
| MABC versus CWOA | 5.48640E-02 | 2.04986E-02 | 2.04986E-02 |
| MABC versus NNA | 1.58264E-01 | 5.73924E-02 | 5.56532E-02 |
| NDE versus MABC | 2.98420E-01 | 1.04939E-01 | 1.04939E-01 |
| NNA versus WW | 3.10137E-01 | 1.05651E-01 | 1.05651E-01 |
| ISCA versus PSO | 4.69614E-01 | 1.54818E-01 | 1.54818E-01 |
| CWOA versus WW | 7.78139E-01 | 2.47978E-01 | 2.47978E-01 |
| DE versus GOTLBO | 9.58593E-01 | 2.94952E-01 | 2.94952E-01 |
| IJAYA versus GOTLBO | 1.0 | 3.72867E-01 | 3.72867E-01 |
| TLBO versus NDE | 1.0 | 4.48866E-01 | 4.48866E-01 |
| NDE versus DE | 1.0 | 4.59538E-01 | 4.59538E-01 |
| ISCA versus CWOA | 1.0 | 5.84482E-01 | 5.84482E-01 |
| PSO versus WW | 1.0 | 8.50607E-01 | 8.50607E-01 |
| GOTLBO versus PSO | 1.0 | 8.85464E-01 | 8.85464E-01 |
| MABC versus GOTLBO | 1.0 | 9.99507E-01 | 9.99507E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| DE versus ISCA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus MABC | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus ISCA | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S149.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *R*p2 evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| STLBO versus ISCA | 1.29319E-12 | 1.29319E-12 | 1.29319E-12 |
| EBLSHADE versus ISCA | 1.98019E-12 | 1.95843E-12 | 1.69731E-12 |
| TLBO versus CWOA | 2.97029E-12 | 2.90501E-12 | 2.54596E-12 |
| EBLSHADE versus GOTLBO | 4.95048E-12 | 4.78728E-12 | 4.24327E-12 |
| TLBO versus PSO | 7.65810E-12 | 7.32148E-12 | 6.56408E-12 |
| ADELI versus ISCA | 1.07900E-11 | 1.01972E-11 | 9.24860E-12 |
| STLBO versus GOTLBO | 2.10951E-11 | 1.97042E-11 | 1.80815E-11 |
| TLBO versus WW | 2.46918E-11 | 2.27924E-11 | 2.11644E-11 |
| EBLSHADE versus NNA | 5.54050E-11 | 5.05342E-11 | 4.74900E-11 |
| TLBO versus MABC | 1.17478E-10 | 1.05859E-10 | 1.00695E-10 |
| ADELI versus GOTLBO | 1.73509E-10 | 1.54442E-10 | 1.48722E-10 |
| STLBO versus NNA | 2.00969E-10 | 1.76676E-10 | 1.72260E-10 |
| ADELI versus NDE | 2.13032E-10 | 1.84940E-10 | 1.82599E-10 |
| EBLSHADE versus MABC | 8.75044E-10 | 7.50037E-10 | 7.50037E-10 |
| ADELI versus NNA | 1.30252E-09 | 1.10213E-09 | 9.59000E-10 |
| STLBO versus NDE | 1.98884E-09 | 1.66101E-09 | 1.46431E-09 |
| STLBO versus MABC | 2.63616E-09 | 2.17266E-09 | 1.94091E-09 |
| TLBO versus NNA | 2.74625E-09 | 2.23321E-09 | 2.02196E-09 |
| EBLSHADE versus WW | 2.80640E-09 | 2.25129E-09 | 2.06625E-09 |
| EBLSHADE versus NDE | 7.72300E-09 | 6.11050E-09 | 5.68616E-09 |
| STLBO versus WW | 7.83965E-09 | 6.11665E-09 | 5.77205E-09 |
| EBLSHADE versus CWOA | 1.17394E-08 | 9.03031E-09 | 8.64329E-09 |
| ADELI versus MABC | 1.31489E-08 | 9.97004E-09 | 9.68105E-09 |
| TLBO versus GOTLBO | 2.67315E-08 | 1.99752E-08 | 1.96815E-08 |
| STLBO versus CWOA | 2.99616E-08 | 2.20597E-08 | 2.20597E-08 |
| ADELI versus WW | 3.51330E-08 | 2.54811E-08 | 2.54811E-08 |
| ADELI versus CWOA | 1.18085E-07 | 8.30485E-08 | 7.52627E-08 |
| EBLSHADE versus PSO | 1.23921E-07 | 8.57914E-08 | 7.89826E-08 |
| STLBO versus PSO | 2.74198E-07 | 1.86816E-07 | 1.74764E-07 |
| TLBO versus ISCA | 3.58779E-07 | 2.40501E-07 | 2.28673E-07 |
| ADELI versus DE | 6.81272E-07 | 4.41704E-07 | 4.34218E-07 |
| ADELI versus PSO | 8.81287E-07 | 5.61700E-07 | 5.61700E-07 |
| STLBO versus DE | 4.36970E-06 | 2.68905E-06 | 2.68905E-06 |
| EBLSHADE versus DE | 1.31819E-05 | 7.96708E-06 | 7.96708E-06 |
| TLBO versus NDE | 2.13413E-04 | 1.26641E-04 | 1.19605E-04 |
| DE versus PSO | 2.69673E-04 | 1.57062E-04 | 1.51136E-04 |
| IJAYA versus PSO | 1.61958E-03 | 9.25474E-04 | 9.07676E-04 |
| DE versus CWOA | 3.22321E-03 | 1.80641E-03 | 1.80641E-03 |
| DE versus WW | 1.08087E-02 | 5.82009E-03 | 5.70131E-03 |
| IJAYA versus CWOA | 1.58994E-02 | 8.38648E-03 | 8.38648E-03 |
| DE versus MABC | 2.54443E-02 | 1.31416E-02 | 1.31416E-02 |
| TLBO versus DE | 4.59507E-02 | 2.32278E-02 | 2.32278E-02 |
| IJAYA versus WW | 4.80428E-02 | 2.37574E-02 | 2.37574E-02 |
| NDE versus PSO | 5.48640E-02 | 2.65276E-02 | 2.59247E-02 |
| IJAYA versus MABC | 1.04642E-01 | 4.94461E-02 | 4.94461E-02 |
| DE versus NNA | 1.34341E-01 | 6.20034E-02 | 6.20034E-02 |
| NDE versus CWOA | 3.47844E-01 | 1.56721E-01 | 1.52898E-01 |
| DE versus GOTLBO | 4.20037E-01 | 1.84631E-01 | 1.84631E-01 |
| IJAYA versus NNA | 4.69614E-01 | 2.01263E-01 | 2.01263E-01 |
| NDE versus WW | 8.34597E-01 | 3.48513E-01 | 3.48513E-01 |
| IJAYA versus GOTLBO | 1.0 | 5.28247E-01 | 5.28247E-01 |
| DE versus ISCA | 1.0 | 5.67461E-01 | 5.67461E-01 |
| NDE versus MABC | 1.0 | 5.88959E-01 | 5.88959E-01 |
| ADELI versus TLBO | 1.0 | 7.16260E-01 | 7.16260E-01 |
| ISCA versus PSO | 1.0 | 7.88189E-01 | 7.64304E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus ISCA | 1.0 | 1.0 | 1.0 |
| NDE versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus GOTLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus PSO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus ISCA | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S150.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *R*s evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| TLBO versus PSO | <1E-13 | <1E-13 | <1E-13 |
| TLBO versus NNA | 1.61648E-12 | 1.59872E-12 | 1.38556E-12 |
| ADELI versus MABC | 2.97029E-12 | 2.90501E-12 | 2.54596E-12 |
| TLBO versus ISCA | 3.55627E-12 | 3.39995E-12 | 3.04823E-12 |
| NDE versus PSO | 3.83915E-12 | 3.62821E-12 | 3.29070E-12 |
| STLBO versus MABC | 5.47584E-12 | 5.11480E-12 | 4.69358E-12 |
| TLBO versus WW | 7.15294E-12 | 6.60272E-12 | 6.13110E-12 |
| EBLSHADE versus GOTLBO | 9.09273E-12 | 8.29337E-12 | 7.79377E-12 |
| EBLSHADE versus MABC | 1.59022E-11 | 1.41547E-11 | 1.36304E-11 |
| STLBO versus GOTLBO | 2.48535E-11 | 2.15761E-11 | 2.13030E-11 |
| ADELI versus GOTLBO | 4.37259E-11 | 3.74794E-11 | 3.74794E-11 |
| EBLSHADE versus CWOA | 8.82399E-11 | 7.46645E-11 | 6.49678E-11 |
| STLBO versus CWOA | 2.16164E-10 | 1.80533E-10 | 1.59154E-10 |
| TLBO versus CWOA | 2.31804E-10 | 1.91047E-10 | 1.70669E-10 |
| ADELI versus CWOA | 3.57284E-10 | 2.90538E-10 | 2.63055E-10 |
| EBLSHADE versus WW | 1.48409E-09 | 1.19054E-09 | 1.09269E-09 |
| TLBO versus GOTLBO | 2.33768E-09 | 1.84959E-09 | 1.72115E-09 |
| EBLSHADE versus ISCA | 2.47565E-09 | 1.93155E-09 | 1.82273E-09 |
| STLBO versus WW | 3.17823E-09 | 2.44479E-09 | 2.34002E-09 |
| ADELI versus WW | 4.87552E-09 | 3.69682E-09 | 3.58967E-09 |
| STLBO versus ISCA | 5.17792E-09 | 3.86922E-09 | 3.81232E-09 |
| ADELI versus DE | 5.20274E-09 | 3.86922E-09 | 3.83059E-09 |
| ADELI versus ISCA | 7.83965E-09 | 5.59975E-09 | 4.99670E-09 |
| STLBO versus DE | 9.03653E-09 | 6.35536E-09 | 5.75955E-09 |
| EBLSHADE versus NNA | 1.31489E-08 | 9.10308E-09 | 8.38061E-09 |
| EBLSHADE versus DE | 2.29314E-08 | 1.56236E-08 | 1.46156E-08 |
| STLBO versus NNA | 2.55057E-08 | 1.70972E-08 | 1.62564E-08 |
| ADELI versus NNA | 3.70334E-08 | 2.44176E-08 | 2.36037E-08 |
| EBLSHADE versus PSO | 8.87455E-08 | 5.75383E-08 | 5.65631E-08 |
| STLBO versus PSO | 1.21526E-07 | 7.74564E-08 | 7.74564E-08 |
| ADELI versus PSO | 1.45251E-07 | 9.09811E-08 | 8.93850E-08 |
| TLBO versus MABC | 3.58779E-07 | 2.20787E-07 | 2.20787E-07 |
| DE versus PSO | 7.84454E-07 | 4.74120E-07 | 4.74120E-07 |
| NDE versus NNA | 8.70224E-05 | 5.16397E-05 | 4.87708E-05 |
| TLBO versus DE | 1.17758E-04 | 6.85844E-05 | 6.59964E-05 |
| ADELI versus NDE | 1.89694E-04 | 1.08397E-04 | 1.06312E-04 |
| MABC versus PSO | 2.26316E-04 | 1.26836E-04 | 1.26836E-04 |
| STLBO versus NDE | 2.85820E-04 | 1.57044E-04 | 1.50762E-04 |
| NDE versus ISCA | 4.52878E-04 | 2.43857E-04 | 2.38881E-04 |
| EBLSHADE versus NDE | 5.68189E-04 | 2.99704E-04 | 2.99704E-04 |
| NDE versus WW | 7.11295E-04 | 3.67372E-04 | 3.67372E-04 |
| IJAYA versus PSO | 4.39395E-03 | 2.22112E-03 | 2.22112E-03 |
| NDE versus CWOA | 5.96060E-03 | 2.94755E-03 | 2.94755E-03 |
| GOTLBO versus PSO | 8.04629E-03 | 3.89051E-03 | 3.80209E-03 |
| NDE versus GOTLBO | 2.31856E-02 | 1.09558E-02 | 1.09558E-02 |
| CWOA versus PSO | 3.05936E-02 | 1.41201E-02 | 1.41201E-02 |
| WW versus PSO | 1.71641E-01 | 7.54467E-02 | 7.54467E-02 |
| DE versus NNA | 1.86050E-01 | 7.97358E-02 | 7.97358E-02 |
| TLBO versus NDE | 2.27059E-01 | 9.48159E-02 | 9.48159E-02 |
| ISCA versus PSO | 2.36193E-01 | 9.60346E-02 | 9.60346E-02 |
| NDE versus MABC | 3.75247E-01 | 1.48450E-01 | 1.48450E-01 |
| DE versus ISCA | 5.43931E-01 | 2.09204E-01 | 2.09204E-01 |
| NNA versus PSO | 6.75361E-01 | 2.52333E-01 | 2.52333E-01 |
| DE versus WW | 7.25121E-01 | 2.62956E-01 | 2.54988E-01 |
| DE versus CWOA | 1.0 | 9.47406E-01 | 9.47406E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus GOTLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus MABC | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus ISCA | 1.0 | 1.0 | 1.0 |
| IJAYA versus NNA | 1.0 | 1.0 | 1.0 |
| IJAYA versus CWOA | 1.0 | 1.0 | 1.0 |
| IJAYA versus WW | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S151.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. *I*ph evaluation task.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| EBLSHADE versus GOTLBO | <1E-13 | <1E-13 | <1E-13 |
| EBLSHADE versus PSO | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus GOTLBO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus GOTLBO | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus PSO | <1E-13 | <1E-13 | <1E-13 |
| EBLSHADE versus MABC | 1.51545E-12 | 1.43219E-12 | 1.29896E-12 |
| STLBO versus MABC | 1.61648E-12 | 1.50990E-12 | 1.38556E-12 |
| ADELI versus MABC | 7.03171E-12 | 6.49081E-12 | 6.02718E-12 |
| TLBO versus WW | 7.79954E-12 | 7.11387E-12 | 6.68532E-12 |
| TLBO versus ISCA | 9.09273E-12 | 8.19345E-12 | 7.79377E-12 |
| TLBO versus NNA | 1.51343E-11 | 1.34712E-11 | 1.29723E-11 |
| TLBO versus CWOA | 3.43907E-11 | 3.02336E-11 | 2.94778E-11 |
| EBLSHADE versus WW | 2.18167E-09 | 1.89398E-09 | 1.87000E-09 |
| NDE versus PSO | 2.53392E-09 | 2.14409E-09 | 1.99224E-09 |
| STLBO versus WW | 2.32428E-09 | 1.99224E-09 | 1.99224E-09 |
| TLBO versus GOTLBO | 2.80640E-09 | 2.34381E-09 | 2.06625E-09 |
| ADELI versus WW | 6.97145E-09 | 5.74570E-09 | 5.13283E-09 |
| ADELI versus PSO | 1.48718E-08 | 1.20936E-08 | 1.09496E-08 |
| TLBO versus MABC | 2.29314E-08 | 1.83955E-08 | 1.68836E-08 |
| TLBO versus PSO | 2.55057E-08 | 2.01803E-08 | 1.87789E-08 |
| NDE versus GOTLBO | 4.90997E-08 | 3.83086E-08 | 3.61503E-08 |
| EBLSHADE versus ISCA | 5.89835E-08 | 4.53719E-08 | 4.34274E-08 |
| STLBO versus ISCA | 6.20553E-08 | 4.70529E-08 | 4.56890E-08 |
| EBLSHADE versus NNA | 7.97656E-08 | 5.96050E-08 | 5.87285E-08 |
| STLBO versus NNA | 8.38271E-08 | 6.17189E-08 | 6.17189E-08 |
| ADELI versus DE | 1.11709E-07 | 8.10200E-08 | 8.10200E-08 |
| EBLSHADE versus CWOA | 1.30023E-07 | 9.28738E-08 | 8.28720E-08 |
| STLBO versus CWOA | 1.36403E-07 | 9.59315E-08 | 8.69379E-08 |
| ADELI versus ISCA | 1.50038E-07 | 1.03872E-07 | 9.56286E-08 |
| ADELI versus NNA | 1.98870E-07 | 1.35494E-07 | 1.26753E-07 |
| ADELI versus CWOA | 3.13904E-07 | 2.10419E-07 | 2.00071E-07 |
| STLBO versus DE | 4.14117E-07 | 2.73044E-07 | 2.63942E-07 |
| EBLSHADE versus DE | 4.44818E-07 | 2.88399E-07 | 2.83511E-07 |
| IJAYA versus PSO | 6.81272E-07 | 4.34218E-07 | 4.34218E-07 |
| NDE versus CWOA | 4.08618E-06 | 2.51457E-06 | 2.51457E-06 |
| NDE versus NNA | 7.80316E-06 | 4.63045E-06 | 4.41426E-06 |
| IJAYA versus GOTLBO | 8.90345E-06 | 5.08769E-06 | 4.98985E-06 |
| DE versus PSO | 1.15721E-05 | 6.48546E-06 | 6.48546E-06 |
| NDE versus ISCA | 1.15721E-05 | 6.48546E-06 | 6.48546E-06 |
| DE versus GOTLBO | 1.25050E-04 | 6.73346E-05 | 6.59604E-05 |
| ADELI versus NDE | 2.39966E-04 | 1.26575E-04 | 1.26575E-04 |
| NDE versus WW | 4.03987E-04 | 2.08653E-04 | 2.08653E-04 |
| IJAYA versus CWOA | 4.03987E-04 | 2.08653E-04 | 2.08653E-04 |
| STLBO versus NDE | 6.72589E-04 | 3.32599E-04 | 3.32599E-04 |
| EBLSHADE versus NDE | 7.11295E-04 | 3.43923E-04 | 3.36107E-04 |
| IJAYA versus NNA | 7.11295E-04 | 3.43923E-04 | 3.36107E-04 |
| IJAYA versus ISCA | 9.92197E-04 | 4.57937E-04 | 4.57937E-04 |
| TLBO versus DE | 1.70903E-03 | 7.70003E-04 | 7.51222E-04 |
| DE versus CWOA | 3.96494E-03 | 1.74283E-03 | 1.74283E-03 |
| DE versus NNA | 6.59115E-03 | 2.82478E-03 | 2.82478E-03 |
| DE versus ISCA | 8.88298E-03 | 3.70937E-03 | 3.70937E-03 |
| IJAYA versus WW | 1.92207E-02 | 7.60380E-03 | 7.60380E-03 |
| NDE versus MABC | 5.24960E-02 | 2.01908E-02 | 2.01908E-02 |
| MABC versus PSO | 1.13790E-01 | 4.25150E-02 | 4.25150E-02 |
| DE versus WW | 1.23672E-01 | 4.48482E-02 | 4.34891E-02 |
| TLBO versus NDE | 3.47844E-01 | 1.22319E-01 | 1.22319E-01 |
| MABC versus GOTLBO | 5.05541E-01 | 1.72217E-01 | 1.72217E-01 |
| IJAYA versus MABC | 9.58593E-01 | 3.16020E-01 | 3.16020E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus PSO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S152.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. RMSPE value.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| EBLSHADE versus ISCA | <1E-13 | <1E-13 | <1E-13 |
| EBLSHADE versus NNA | <1E-13 | <1E-13 | <1E-13 |
| EBLSHADE versus CWOA | <1E-13 | <1E-13 | <1E-13 |
| EBLSHADE versus WW | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus ISCA | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus NNA | <1E-13 | <1E-13 | <1E-13 |
| ADELI versus CWOA | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus ISCA | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus NNA | <1E-13 | <1E-13 | <1E-13 |
| STLBO versus CWOA | <1E-13 | <1E-13 | <1E-13 |
| TLBO versus PSO | 1.37401E-12 | 1.22302E-12 | 1.17772E-12 |
| NDE versus CWOA | 1.43463E-12 | 1.26121E-12 | 1.22968E-12 |
| NDE versus NNA | 3.51585E-12 | 3.05223E-12 | 3.01359E-12 |
| ADELI versus MABC | 6.54676E-12 | 5.53957E-12 | 5.12657E-12 |
| NDE versus ISCA | 5.98099E-12 | 5.12657E-12 | 5.12657E-12 |
| STLBO versus MABC | 6.54676E-12 | 5.53957E-12 | 5.12657E-12 |
| NDE versus WW | 8.34510E-12 | 6.87783E-12 | 6.14420E-12 |
| EBLSHADE versus MABC | 4.96665E-11 | 4.03881E-11 | 3.65676E-11 |
| EBLSHADE versus PSO | 2.00969E-10 | 1.61217E-10 | 1.47967E-10 |
| TLBO versus GOTLBO | 8.75044E-10 | 6.92342E-10 | 6.44263E-10 |
| ADELI versus PSO | 1.00018E-09 | 7.80360E-10 | 7.36396E-10 |
| STLBO versus PSO | 1.00018E-09 | 7.80360E-10 | 7.36396E-10 |
| NDE versus GOTLBO | 1.22083E-09 | 9.25684E-10 | 8.98853E-10 |
| ADELI versus DE | 1.55916E-09 | 1.16509E-09 | 1.14795E-09 |
| STLBO versus DE | 1.55916E-09 | 1.16509E-09 | 1.14795E-09 |
| EBLSHADE versus DE | 9.77290E-09 | 7.08804E-09 | 7.08804E-09 |
| ADELI versus WW | 1.85769E-08 | 1.32692E-08 | 1.18402E-08 |
| STLBO versus WW | 1.85769E-08 | 1.32692E-08 | 1.18402E-08 |
| TLBO versus MABC | 2.29314E-08 | 1.58756E-08 | 1.46156E-08 |
| TLBO versus ISCA | 3.51330E-08 | 2.39368E-08 | 2.23925E-08 |
| TLBO versus NNA | 4.80531E-08 | 3.22114E-08 | 3.06272E-08 |
| IJAYA versus WW | 4.90997E-08 | 3.23734E-08 | 3.12943E-08 |
| EBLSHADE versus GOTLBO | 6.86488E-08 | 4.45086E-08 | 4.37542E-08 |
| TLBO versus CWOA | 8.80796E-08 | 5.61386E-08 | 5.61386E-08 |
| ADELI versus GOTLBO | 2.08311E-07 | 1.30480E-07 | 1.28191E-07 |
| STLBO versus GOTLBO | 2.08311E-07 | 1.30480E-07 | 1.28191E-07 |
| TLBO versus WW | 4.67004E-07 | 2.82255E-07 | 2.82255E-07 |
| IJAYA versus CWOA | 6.81272E-07 | 4.04272E-07 | 3.81812E-07 |
| IJAYA versus NNA | 1.57507E-06 | 9.17350E-07 | 8.82733E-07 |
| NDE versus PSO | 1.68754E-06 | 9.64306E-07 | 9.45762E-07 |
| TLBO versus DE | 2.37760E-06 | 1.33250E-06 | 1.33250E-06 |
| IJAYA versus ISCA | 2.37760E-06 | 1.33250E-06 | 1.33250E-06 |
| IJAYA versus GOTLBO | 1.25050E-04 | 6.32121E-05 | 6.32121E-05 |
| DE versus WW | 2.26316E-04 | 1.11914E-04 | 1.11914E-04 |
| DE versus CWOA | 1.70903E-03 | 8.26344E-04 | 8.07564E-04 |
| NDE versus MABC | 2.23150E-03 | 1.05444E-03 | 1.05444E-03 |
| DE versus NNA | 3.22321E-03 | 1.48763E-03 | 1.48763E-03 |
| DE versus ISCA | 4.39395E-03 | 1.97969E-03 | 1.93141E-03 |
| MABC versus WW | 7.28445E-03 | 3.12191E-03 | 3.12191E-03 |
| IJAYA versus PSO | 2.11160E-02 | 8.81767E-03 | 8.81767E-03 |
| MABC versus CWOA | 4.01728E-02 | 1.63340E-02 | 1.63340E-02 |
| NDE versus DE | 5.02234E-02 | 1.98686E-02 | 1.98686E-02 |
| MABC versus NNA | 6.82680E-02 | 2.62569E-02 | 2.62569E-02 |
| DE versus GOTLBO | 8.11168E-02 | 3.03074E-02 | 3.03074E-02 |
| MABC versus ISCA | 8.83504E-02 | 3.20392E-02 | 3.10683E-02 |
| ADELI versus NDE | 9.21871E-02 | 3.24174E-02 | 3.24174E-02 |
| STLBO versus NDE | 9.21871E-02 | 3.24174E-02 | 3.24174E-02 |
| EBLSHADE versus NDE | 2.36193E-01 | 7.78659E-02 | 7.78659E-02 |
| MABC versus GOTLBO | 9.58593E-01 | 3.05486E-01 | 3.05486E-01 |
| PSO versus WW | 1.0 | 3.15856E-01 | 3.15856E-01 |
| IJAYA versus MABC | 1.0 | 6.25076E-01 | 6.25076E-01 |
| DE versus PSO | 1.0 | 7.69767E-01 | 7.69767E-01 |
| TLBO versus NDE | 1.0 | 8.59568E-01 | 8.59568E-01 |
| PSO versus CWOA | 1.0 | 8.59568E-01 | 8.59568E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus PSO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus PSO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |

**Table S153.** Adjusted *p*-values for tests for multiple comparisons among all methods in the single-IV case. Comp parameter.

| Hypothesis | post-hoc procedure | | |
| --- | --- | --- | --- |
| Nemenyi | Holm | Shaffer |
| EBLSHADE versus WW | 9.13562E-05 | 9.13562E-05 | 9.13562E-05 |
| EBLSHADE versus CWOA | 1.78593E-04 | 1.76630E-04 | 1.53079E-04 |
| EBLSHADE versus PSO | 2.03794E-04 | 1.99315E-04 | 1.74680E-04 |
| EBLSHADE versus NNA | 3.51080E-03 | 3.39506E-03 | 3.00926E-03 |
| EBLSHADE versus GOTLBO | 4.42051E-03 | 4.22620E-03 | 3.78901E-03 |
| ADELI versus WW | 4.42051E-03 | 4.22620E-03 | 3.78901E-03 |
| STLBO versus WW | 6.21372E-03 | 5.80403E-03 | 5.32605E-03 |
| TLBO versus WW | 6.95110E-03 | 6.41640E-03 | 5.95809E-03 |
| ADELI versus CWOA | 7.77070E-03 | 7.08756E-03 | 6.66060E-03 |
| EBLSHADE versus ISCA | 8.68102E-03 | 7.82246E-03 | 7.44088E-03 |
| ADELI versus PSO | 8.68102E-03 | 7.82246E-03 | 7.44088E-03 |
| STLBO versus CWOA | 1.08120E-02 | 9.50506E-03 | 9.26744E-03 |
| TLBO versus PSO | 1.34296E-02 | 1.13635E-02 | 1.03320E-02 |
| TLBO versus CWOA | 1.20540E-02 | 1.04645E-02 | 1.03320E-02 |
| STLBO versus PSO | 1.20540E-02 | 1.04645E-02 | 1.03320E-02 |
| EBLSHADE versus MABC | 6.90283E-02 | 5.76500E-02 | 5.08231E-02 |
| ADELI versus NNA | 9.20449E-02 | 7.48497E-02 | 6.77693E-02 |
| ADELI versus GOTLBO | 1.11137E-01 | 8.91541E-02 | 8.18263E-02 |
| STLBO versus NNA | 1.21998E-01 | 9.65262E-02 | 8.98230E-02 |
| TLBO versus NNA | 1.33831E-01 | 1.04418E-01 | 9.85352E-02 |
| STLBO versus GOTLBO | 1.46714E-01 | 1.12857E-01 | 1.08020E-01 |
| TLBO versus GOTLBO | 1.60730E-01 | 1.21872E-01 | 1.18339E-01 |
| ADELI versus ISCA | 1.92520E-01 | 1.43861E-01 | 1.41746E-01 |
| STLBO versus ISCA | 2.51119E-01 | 1.84890E-01 | 1.84890E-01 |
| TLBO versus ISCA | 2.74012E-01 | 1.98734E-01 | 1.98734E-01 |
| EBLSHADE versus DE | 3.54582E-01 | 2.53273E-01 | 2.25997E-01 |
| ADELI versus MABC | 1.0 | 7.11524E-01 | 6.44819E-01 |
| NDE versus WW | 1.0 | 8.02025E-01 | 7.50281E-01 |
| STLBO versus MABC | 1.0 | 8.50346E-01 | 8.08525E-01 |
| TLBO versus MABC | 1.0 | 8.85738E-01 | 8.70725E-01 |
| EBLSHADE versus NDE | 1.0 | 9.20945E-01 | 9.04788E-01 |
| DE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| DE versus ADELI | 1.0 | 1.0 | 1.0 |
| DE versus NDE | 1.0 | 1.0 | 1.0 |
| DE versus MABC | 1.0 | 1.0 | 1.0 |
| DE versus TLBO | 1.0 | 1.0 | 1.0 |
| DE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| DE versus STLBO | 1.0 | 1.0 | 1.0 |
| DE versus PSO | 1.0 | 1.0 | 1.0 |
| DE versus IJAYA | 1.0 | 1.0 | 1.0 |
| DE versus ISCA | 1.0 | 1.0 | 1.0 |
| DE versus NNA | 1.0 | 1.0 | 1.0 |
| DE versus CWOA | 1.0 | 1.0 | 1.0 |
| DE versus WW | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus ADELI | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus TLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus STLBO | 1.0 | 1.0 | 1.0 |
| EBLSHADE versus IJAYA | 1.0 | 1.0 | 1.0 |
| ADELI versus DE | 1.0 | 1.0 | 1.0 |
| ADELI versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ADELI versus NDE | 1.0 | 1.0 | 1.0 |
| ADELI versus TLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus STLBO | 1.0 | 1.0 | 1.0 |
| ADELI versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus DE | 1.0 | 1.0 | 1.0 |
| NDE versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NDE versus ADELI | 1.0 | 1.0 | 1.0 |
| NDE versus MABC | 1.0 | 1.0 | 1.0 |
| NDE versus TLBO | 1.0 | 1.0 | 1.0 |
| NDE versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NDE versus STLBO | 1.0 | 1.0 | 1.0 |
| NDE versus PSO | 1.0 | 1.0 | 1.0 |
| NDE versus IJAYA | 1.0 | 1.0 | 1.0 |
| NDE versus ISCA | 1.0 | 1.0 | 1.0 |
| NDE versus NNA | 1.0 | 1.0 | 1.0 |
| NDE versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus DE | 1.0 | 1.0 | 1.0 |
| MABC versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| MABC versus ADELI | 1.0 | 1.0 | 1.0 |
| MABC versus NDE | 1.0 | 1.0 | 1.0 |
| MABC versus TLBO | 1.0 | 1.0 | 1.0 |
| MABC versus GOTLBO | 1.0 | 1.0 | 1.0 |
| MABC versus STLBO | 1.0 | 1.0 | 1.0 |
| MABC versus PSO | 1.0 | 1.0 | 1.0 |
| MABC versus IJAYA | 1.0 | 1.0 | 1.0 |
| MABC versus ISCA | 1.0 | 1.0 | 1.0 |
| MABC versus NNA | 1.0 | 1.0 | 1.0 |
| MABC versus CWOA | 1.0 | 1.0 | 1.0 |
| MABC versus WW | 1.0 | 1.0 | 1.0 |
| TLBO versus DE | 1.0 | 1.0 | 1.0 |
| TLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| TLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| TLBO versus NDE | 1.0 | 1.0 | 1.0 |
| TLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| TLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus DE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NDE | 1.0 | 1.0 | 1.0 |
| GOTLBO versus MABC | 1.0 | 1.0 | 1.0 |
| GOTLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus STLBO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus PSO | 1.0 | 1.0 | 1.0 |
| GOTLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus ISCA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus NNA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus CWOA | 1.0 | 1.0 | 1.0 |
| GOTLBO versus WW | 1.0 | 1.0 | 1.0 |
| STLBO versus DE | 1.0 | 1.0 | 1.0 |
| STLBO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| STLBO versus ADELI | 1.0 | 1.0 | 1.0 |
| STLBO versus NDE | 1.0 | 1.0 | 1.0 |
| STLBO versus TLBO | 1.0 | 1.0 | 1.0 |
| STLBO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus DE | 1.0 | 1.0 | 1.0 |
| PSO versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| PSO versus ADELI | 1.0 | 1.0 | 1.0 |
| PSO versus NDE | 1.0 | 1.0 | 1.0 |
| PSO versus MABC | 1.0 | 1.0 | 1.0 |
| PSO versus TLBO | 1.0 | 1.0 | 1.0 |
| PSO versus GOTLBO | 1.0 | 1.0 | 1.0 |
| PSO versus STLBO | 1.0 | 1.0 | 1.0 |
| PSO versus IJAYA | 1.0 | 1.0 | 1.0 |
| PSO versus ISCA | 1.0 | 1.0 | 1.0 |
| PSO versus NNA | 1.0 | 1.0 | 1.0 |
| PSO versus CWOA | 1.0 | 1.0 | 1.0 |
| PSO versus WW | 1.0 | 1.0 | 1.0 |
| IJAYA versus DE | 1.0 | 1.0 | 1.0 |
| IJAYA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| IJAYA versus ADELI | 1.0 | 1.0 | 1.0 |
| IJAYA versus NDE | 1.0 | 1.0 | 1.0 |
| IJAYA versus MABC | 1.0 | 1.0 | 1.0 |
| IJAYA versus TLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus STLBO | 1.0 | 1.0 | 1.0 |
| IJAYA versus PSO | 1.0 | 1.0 | 1.0 |
| IJAYA versus ISCA | 1.0 | 1.0 | 1.0 |
| IJAYA versus NNA | 1.0 | 1.0 | 1.0 |
| IJAYA versus CWOA | 1.0 | 1.0 | 1.0 |
| IJAYA versus WW | 1.0 | 1.0 | 1.0 |
| ISCA versus DE | 1.0 | 1.0 | 1.0 |
| ISCA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| ISCA versus ADELI | 1.0 | 1.0 | 1.0 |
| ISCA versus NDE | 1.0 | 1.0 | 1.0 |
| ISCA versus MABC | 1.0 | 1.0 | 1.0 |
| ISCA versus TLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus STLBO | 1.0 | 1.0 | 1.0 |
| ISCA versus PSO | 1.0 | 1.0 | 1.0 |
| ISCA versus IJAYA | 1.0 | 1.0 | 1.0 |
| ISCA versus NNA | 1.0 | 1.0 | 1.0 |
| ISCA versus CWOA | 1.0 | 1.0 | 1.0 |
| ISCA versus WW | 1.0 | 1.0 | 1.0 |
| NNA versus DE | 1.0 | 1.0 | 1.0 |
| NNA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| NNA versus ADELI | 1.0 | 1.0 | 1.0 |
| NNA versus NDE | 1.0 | 1.0 | 1.0 |
| NNA versus MABC | 1.0 | 1.0 | 1.0 |
| NNA versus TLBO | 1.0 | 1.0 | 1.0 |
| NNA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| NNA versus STLBO | 1.0 | 1.0 | 1.0 |
| NNA versus PSO | 1.0 | 1.0 | 1.0 |
| NNA versus IJAYA | 1.0 | 1.0 | 1.0 |
| NNA versus ISCA | 1.0 | 1.0 | 1.0 |
| NNA versus CWOA | 1.0 | 1.0 | 1.0 |
| NNA versus WW | 1.0 | 1.0 | 1.0 |
| CWOA versus DE | 1.0 | 1.0 | 1.0 |
| CWOA versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| CWOA versus ADELI | 1.0 | 1.0 | 1.0 |
| CWOA versus NDE | 1.0 | 1.0 | 1.0 |
| CWOA versus MABC | 1.0 | 1.0 | 1.0 |
| CWOA versus TLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus GOTLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus STLBO | 1.0 | 1.0 | 1.0 |
| CWOA versus PSO | 1.0 | 1.0 | 1.0 |
| CWOA versus IJAYA | 1.0 | 1.0 | 1.0 |
| CWOA versus ISCA | 1.0 | 1.0 | 1.0 |
| CWOA versus NNA | 1.0 | 1.0 | 1.0 |
| CWOA versus WW | 1.0 | 1.0 | 1.0 |
| WW versus DE | 1.0 | 1.0 | 1.0 |
| WW versus EBLSHADE | 1.0 | 1.0 | 1.0 |
| WW versus ADELI | 1.0 | 1.0 | 1.0 |
| WW versus NDE | 1.0 | 1.0 | 1.0 |
| WW versus MABC | 1.0 | 1.0 | 1.0 |
| WW versus TLBO | 1.0 | 1.0 | 1.0 |
| WW versus GOTLBO | 1.0 | 1.0 | 1.0 |
| WW versus STLBO | 1.0 | 1.0 | 1.0 |
| WW versus PSO | 1.0 | 1.0 | 1.0 |
| WW versus IJAYA | 1.0 | 1.0 | 1.0 |
| WW versus ISCA | 1.0 | 1.0 | 1.0 |
| WW versus NNA | 1.0 | 1.0 | 1.0 |
| WW versus CWOA | 1.0 | 1.0 | 1.0 |