

**Additional file 2**  
**Table A2 - Results of scenarios 7 and 8**

| True HR<br>and $c^p$ | Method                           | Mean estimate | Mean SE | SE of<br>mean | 95% Confidence<br>interval |         | Bias    | MSE    | Coverage (%) | Successful<br>estimation (%) |
|----------------------|----------------------------------|---------------|---------|---------------|----------------------------|---------|---------|--------|--------------|------------------------------|
|                      |                                  |               |         |               | Lower                      | Upper   |         |        |              |                              |
| 0.9 & 1.23           | <b>Hazard ratio methods</b>      |               |         |               |                            |         |         |        |              |                              |
|                      | ITT                              | 0.9331        | 0.0912  | 0.0952        | 0.7703                     | 1.1302  | 0.0331  | 0.0102 | 92.3         | 100.0                        |
|                      | PP - Excluding switchers         | 0.9145        | 0.1145  | 0.1162        | 0.7155                     | 1.1688  | 0.0145  | 0.0137 | 94.9         | 100.0                        |
|                      | PP - Censor at switch            | 1.6881        | 0.2122  | 0.2132        | 1.3196                     | 2.1597  | 0.7881  | 0.6666 | 0.1          | 100.0                        |
|                      | Time-dependent covariate         | 2.2733        | 0.2704  | 0.2713        | 1.8005                     | 2.8703  | 1.3733  | 1.9595 | 0.0          | 100.0                        |
|                      | Law and Kaldor                   | 0.9382        | 0.1179  | 0.1210        | 0.7333                     | 1.2003  | 0.0382  | 0.0161 | 93.9         | 100.0                        |
|                      | Loeys and Goethebeur             | 0.8652        | -       | 0.2088        | 0.5520                     | 1.4122  | -0.0348 | 0.0448 | 92.6         | 100.0                        |
|                      | <b>AFT methods</b>               |               |         |               |                            |         |         |        |              |                              |
|                      | ITT                              | 1.1846        | 0.2318  | 0.2438        | 0.8074                     | 1.7386  | -0.0500 | 0.0619 | 92.5         | 100.0                        |
|                      | PP - Excluding switchers         | 1.2548        | 0.1145  | 0.3259        | 0.7694                     | 2.0481  | 0.0202  | 0.1066 | 95.2         | 100.0                        |
|                      | PP - Censor at switch            | 0.3807        | 0.0946  | 0.0965        | 0.2340                     | 0.6200  | -0.8539 | 0.7384 | 0.0          | 100.0                        |
|                      | Robins and Tsiatis - Logrank     | 1.2791        | -       | 0.3729        | 0.7230                     | 2.1718  | 0.0445  | 0.1410 | 93.6         | 100.0                        |
|                      | Robins and Tsiatis - Cox         | 1.2763        | -       | 0.3695        | 0.7187                     | 2.1811  | 0.0417  | 0.1383 | 93.8         | 96.4                         |
|                      | Robins and Tsiatis - Exponential | 1.2925        | -       | 0.3577        | 0.9264                     | 1.9155  | 0.0579  | 0.1313 | 82.6         | 100.0                        |
|                      | Robins and Tsiatis - Weibull     | 1.2793        | -       | 0.3726        | 0.7321                     | 2.1830  | 0.0448  | 0.1409 | 93.1         | 100.0                        |
|                      | Branson and Whitehead            | 1.2757        | 0.2498  | 0.3499        | 0.8692                     | 1.8728  | 0.0411  | 0.1241 | 83.7         | 100.0                        |
|                      | Walker et al                     | 2.1688        | 0.8430  | 0.8678        | 1.0268                     | 12.4920 | 0.9342  | 1.6258 | 68.6         | 100.0                        |
| 0.7 & 2.04           | <b>Hazard ratio methods</b>      |               |         |               |                            |         |         |        |              |                              |
|                      | ITT                              | 0.7911        | 0.0801  | 0.0799        | 0.6487                     | 0.9648  | 0.0911  | 0.0147 | 78.8         | 100.0                        |
|                      | PP - Excluding switchers         | 0.7115        | 0.0907  | 0.0894        | 0.5542                     | 0.9135  | 0.0115  | 0.0081 | 95.8         | 100.0                        |
|                      | PP - Censor at switch            | 1.3084        | 0.1679  | 0.1613        | 1.0174                     | 1.6827  | 0.6084  | 0.3962 | 0.0          | 100.0                        |
|                      | Time-dependent covariate         | 1.7865        | 0.2159  | 0.2074        | 1.4097                     | 2.2641  | 1.0865  | 1.2235 | 0.0          | 100.0                        |
|                      | Law and Kaldor                   | 0.7941        | 0.1053  | 0.1043        | 0.6123                     | 1.0297  | 0.0941  | 0.0197 | 85.8         | 100.0                        |
|                      | Loeys and Goethebeur             | 0.5872        | -       | 0.1409        | 0.3547                     | 0.9471  | -0.1128 | 0.0326 | 87.6         | 100.0                        |
|                      | <b>AFT methods</b>               |               |         |               |                            |         |         |        |              |                              |
|                      | ITT                              | 1.6499        | 0.3358  | 0.3436        | 1.1073                     | 2.4592  | -0.3909 | 0.2709 | 78.3         | 100.0                        |
|                      | PP - Excluding switchers         | 2.0717        | 0.5291  | 0.5357        | 1.2564                     | 3.4192  | 0.0309  | 0.2880 | 95.5         | 100.0                        |
|                      | PP - Censor at switch            | 0.6217        | 0.1551  | 0.1499        | 0.3814                     | 1.0143  | -1.4191 | 2.0364 | 0.0          | 100.0                        |
|                      | Robins and Tsiatis - Logrank     | 2.1084        | -       | 0.6375        | 1.1770                     | 3.7068  | 0.0676  | 0.4110 | 95.0         | 100.0                        |
|                      | Robins and Tsiatis - Cox         | 2.1030        | -       | 0.6356        | 1.1657                     | 27.3214 | 0.0622  | 0.4079 | 95.3         | 92.8                         |
|                      | Robins and Tsiatis - Exponential | 2.1095        | -       | 0.6432        | 1.3642                     | 3.3313  | 0.0687  | 0.4184 | 86.8         | 100.0                        |
|                      | Robins and Tsiatis - Weibull     | 2.1079        | -       | 0.6375        | 1.1798                     | 3.7363  | 0.0671  | 0.4109 | 94.9         | 100.0                        |
|                      | Branson and Whitehead            | 2.0504        | 0.4189  | 0.5733        | 1.3741                     | 3.0607  | 0.0095  | 0.3288 | 85.3         | 100.0                        |
|                      | Walker et al                     | 3.6622        | 1.4002  | 1.2856        | 1.7506                     | 12.4920 | 1.6214  | 4.2816 | 68.6         | 96.4                         |