Results simulation study DelayedGSD

March 10, 2023

1 Rejection rate

Power by method (columns) and scenario (rows): (nominal level 80%)

scenario	N	missing	binding	fixC	ar	method 1	method 2	method 3
1	10000	TRUE	TRUE	FALSE	10	81.00	80.79	80.45
3	10000	TRUE	TRUE	FALSE	5	80.60	80.45	80.21
5	10000	TRUE	TRUE	TRUE	10	79.81	80.41	80.39
7	10000	TRUE	TRUE	TRUE	5	80.00	80.46	80.08
9	10000	TRUE	FALSE	TRUE	10	80.50	80.85	80.91
11	10000	TRUE	FALSE	TRUE	5	80.73	80.82	80.75
13	10000	TRUE	FALSE	FALSE	10	80.67	80.60	80.65
15	10000	TRUE	FALSE	FALSE	5	80.65	80.64	80.46
17	10000	FALSE	TRUE	FALSE	5	80.31	80.28	79.93

⚠ slightly too high power for some scenario

Type 1 error by method (columns) and scenario (rows): (nominal level 2.5%)

scenario	N	missing	binding	fixC	ar	method 1	method 2	method 3
2	10000	TRUE	TRUE	FALSE	10	2.46	2.53	2.40
4	10000	TRUE	TRUE	FALSE	5	2.42	2.41	2.40
6	10000	TRUE	TRUE	TRUE	10	2.25	2.25	2.45
8	10000	TRUE	TRUE	TRUE	5	2.42	2.39	2.50
10	10000	TRUE	FALSE	TRUE	10	2.16	2.18	2.31
12	10000	TRUE	FALSE	TRUE	5	2.36	2.35	2.38
14	10000	TRUE	FALSE	FALSE	10	2.44	2.44	2.58
16	10000	TRUE	FALSE	FALSE	5	2.51	2.50	2.58
18	10000	FALSE	TRUE	FALSE	5	2.46	2.44	2.45

Type 1 error slightly below nominal level when fixC is TRUE (as expected?)

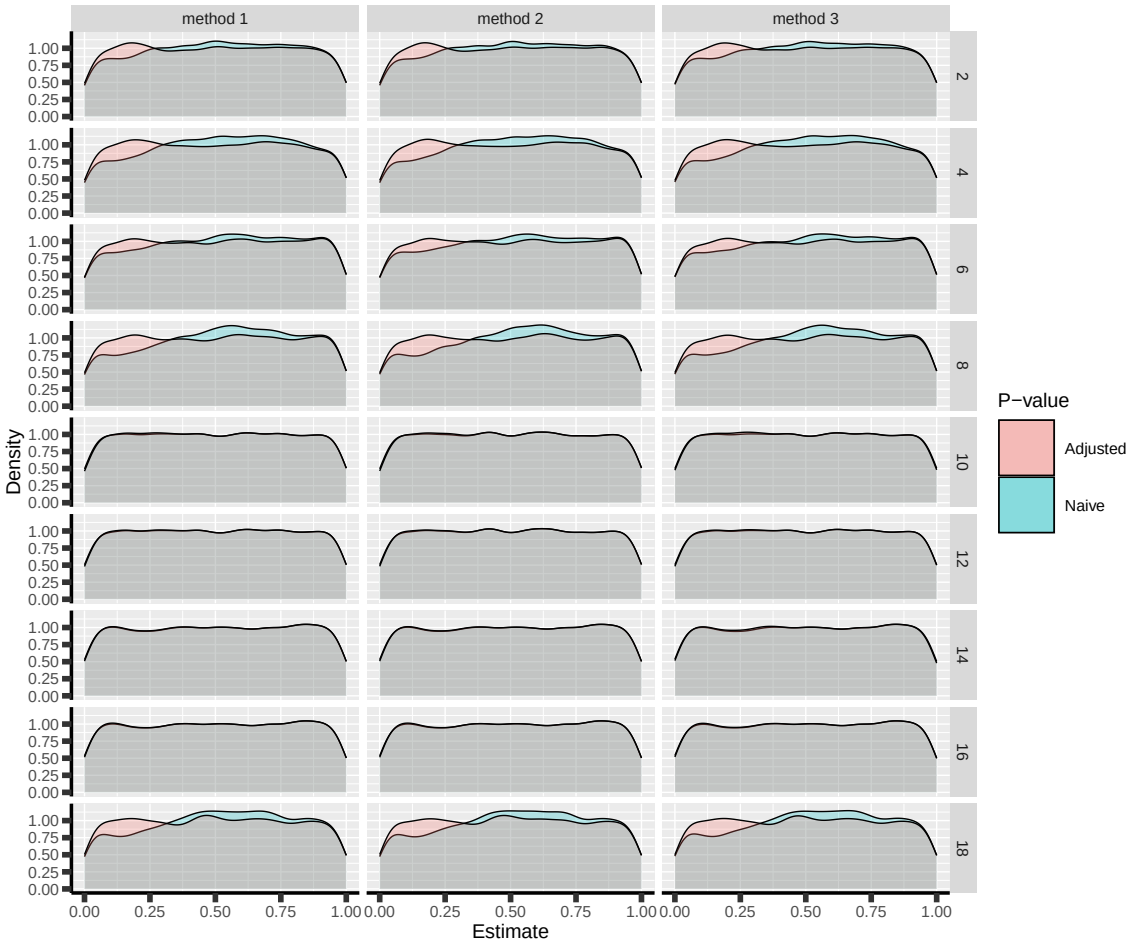

Figure 1: Naive and adjusted p-value distribution over all simulations under the null. Each row correspond to a different scenario

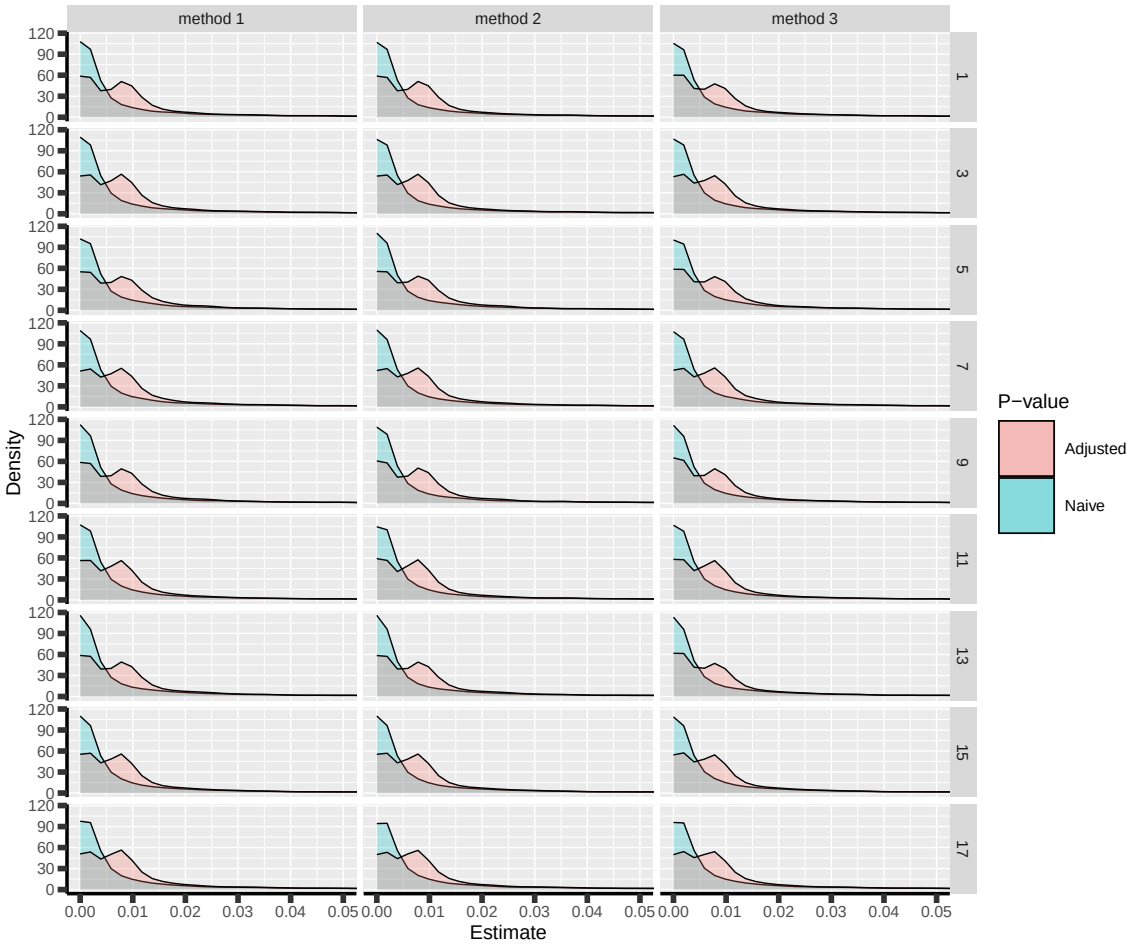

Figure 2: Naive and adjusted p-value distribution over all simulations under the alternative. Each row correspond to a different scenario

2 Conclusion of the trial

Relative frequency of stopping for efficacy/futility at decision/final

- Method 1

	N	missing	hypo	binding	fixC	ar	decision.eff	decision.fut	final.eff	final.fut
1:	10000	TRUE	power	TRUE	FALSE	10	37.82	6.05	43.18	13.0
2:	10000	TRUE	typeI	TRUE	FALSE	10	0.79	70.85	1.67	26.7
3:	10000	TRUE	power	TRUE	FALSE	5	35.60	6.02	45.00	13.4
4:	10000	TRUE	typeI	TRUE	FALSE	5	0.68	69.21	1.74	28.4
5:	10000	TRUE	power	TRUE	TRUE	10	36.45	6.53	43.36	13.7
6:	10000	TRUE	typeI	TRUE	TRUE	10	0.64	71.29	1.61	26.5
7:	10000	TRUE	power	TRUE	TRUE	5	34.68	5.86	45.32	14.1
8:	10000	TRUE	typeI	TRUE	TRUE	5	0.72	69.11	1.70	28.5
9:	10000	TRUE	power	FALSE	TRUE	10	37.57	6.63	42.93	12.9
10:	10000	TRUE	typeI	FALSE	TRUE	10	0.57	0.28	1.59	97.6
11:	10000	TRUE	power	FALSE	TRUE	5	36.02	6.28	44.71	13.0
12:	10000	TRUE	typeI	FALSE	TRUE	5	0.73	0.09	1.63	97.5
13:	10000	TRUE	power	FALSE	FALSE	10	38.32	5.87	42.35	13.5
14:	10000	TRUE	typeI	FALSE	FALSE	10	0.69	0.09	1.75	97.5
15:	10000	TRUE	power	FALSE	FALSE	5	36.75	5.70	43.90	13.6
16:	10000	TRUE	typeI	FALSE	FALSE	5	0.67	0.00	1.84	97.5
17:	10000	FALSE	power	TRUE	FALSE	5	33.98	5.33	46.33	14.4
18:	10000	FALSE	typeI	TRUE	FALSE	5	0.74	67.48	1.72	30.1

Method 2:

	N	missing	hypo	binding	fixC	ar	decision.eff	decision.fut	final.eff	final.fut
1:	10000	TRUE	power	TRUE	FALSE	10	37.66	6.22	43.13	13.0
2:	10000	TRUE	typeI	TRUE	FALSE	10	0.85	71.18	1.68	26.3
3:	10000	TRUE	power	TRUE	FALSE	5	35.55	6.10	44.90	13.5
4:	10000	TRUE	typeI	TRUE	FALSE	5	0.67	69.05	1.74	28.5
5:	10000	TRUE	power	TRUE	TRUE	10	36.82	5.94	43.59	13.6
6:	10000	TRUE	typeI	TRUE	TRUE	10	0.63	70.02	1.62	27.7
7:	10000	TRUE	power	TRUE	TRUE	5	35.06	5.63	45.40	13.9
8:	10000	TRUE	typeI	TRUE	TRUE	5	0.71	68.46	1.68	29.1
9:	10000	TRUE	power	FALSE	TRUE	10	37.76	6.21	43.09	12.9
10:	10000	TRUE	typeI	FALSE	TRUE	10	0.56	0.26	1.62	97.6
11:	10000	TRUE	power	FALSE	TRUE	5	36.07	6.10	44.75	13.1
12:	10000	TRUE	typeI	FALSE	TRUE	5	0.72	0.07	1.63	97.6
13:	10000	TRUE	power	FALSE	FALSE	10	38.33	6.11	42.27	13.3
14:	10000	TRUE	typeI	FALSE	FALSE	10	0.69	0.09	1.75	97.5
15:	10000	TRUE	power	FALSE	FALSE	5	36.78	5.72	43.86	13.6
16:	10000	TRUE	typeI	FALSE	FALSE	5	0.66	0.01	1.84	97.5
17:	10000	FALSE	power	TRUE	FALSE	5	33.68	5.17	46.60	14.5
18:	10000	FALSE	typeI	TRUE	FALSE	5	0.72	67.42	1.72	30.1

Method 3:

	N	missing	hypo	binding	fixC	ar	decision.eff	decision.fut	final.eff	final.fut
1:	10000	TRUE	power	TRUE	FALSE	10	40.44	6.54	40.01	13.0
2:	10000	TRUE	typeI	TRUE	FALSE	10	0.74	68.77	1.66	28.8
3:	10000	TRUE	power	TRUE	FALSE	5	36.49	6.42	43.72	13.4
4:	10000	TRUE	typeI	TRUE	FALSE	5	0.68	68.37	1.72	29.2
5:	10000	TRUE	power	TRUE	TRUE	10	39.85	5.83	40.54	13.8
6:	10000	TRUE	typeI	TRUE	TRUE	10	0.73	68.89	1.72	28.7
7:	10000	TRUE	power	TRUE	TRUE	5	35.70	5.81	44.38	14.1
8:	10000	TRUE	typeI	TRUE	TRUE	5	0.78	68.26	1.72	29.2
9:	10000	TRUE	power	FALSE	TRUE	10	41.03	6.39	39.88	12.7
10:	10000	TRUE	typeI	FALSE	TRUE	10	0.72	0.38	1.59	97.3
11:	10000	TRUE	power	FALSE	TRUE	5	37.08	6.14	43.67	13.1
12:	10000	TRUE	typeI	FALSE	TRUE	5	0.74	0.14	1.64	97.5
13:	10000	TRUE	power	FALSE	FALSE	10	41.47	6.05	39.18	13.3
14:	10000	TRUE	typeI	FALSE	FALSE	10	0.81	0.31	1.77	97.1
15:	10000	TRUE	power	FALSE	FALSE	5	37.37	5.86	43.09	13.7
16:	10000	TRUE	typeI	FALSE	FALSE	5	0.75	0.08	1.83	97.3
17:	10000	FALSE	power	TRUE	FALSE	5	34.66	5.58	45.27	14.5
18:	10000	FALSE	typeI	TRUE	FALSE	5	0.68	66.54	1.77	31.0

3 Bias (True effect: 0.6 under the alternative)

Bias per estimator and method[1]:

	hypo	missing	binding	fixC	ar	biasMLE1	biasMLE2	biasMLE3	biasMUE1	biasMUE2	biasMUE3
1:	power	TRUE	TRUE	FALSE	10	0.012970	0.013058	0.014139	5.47e-03	5.56e-03	0.001778
2:	typeI	TRUE	TRUE	FALSE	10	-0.018416	-0.018430	-0.018509	-4.26e-03	-4.33e-03	-0.004919
3:	power	TRUE	TRUE	FALSE	5	0.022430	0.022231	0.023386	1.01e-02	1.02e-02	0.008425
4:	typeI	TRUE	TRUE	FALSE	5	-0.030419	-0.030822	-0.030577	-1.18e-02	-1.21e-02	-0.012275
5:	power	TRUE	TRUE	TRUE	10	0.011558	0.012119	0.012968	-1.55e-04	8.16e-04	0.001723
6:	typeI	TRUE	TRUE	TRUE	10	-0.022074	-0.022256	-0.022266	-9.04e-03	-9.08e-03	-0.008580
7:	power	TRUE	TRUE	TRUE	5	0.021638	0.022029	0.022692	7.84e-03	8.10e-03	0.008201
8:	typeI	TRUE	TRUE	TRUE	5	-0.033857	-0.034379	-0.034138	-1.50e-02	-1.51e-02	-0.015168
9:	power	TRUE	FALSE	TRUE	10	0.015026	0.015050	0.016312	-7.62e-04	-4.88e-04	0.000843
10:	typeI	TRUE	FALSE	TRUE	10	0.000543	0.000547	0.000883	-6.54e-05	-1.08e-06	0.001751
11:	power	TRUE	FALSE	TRUE	5	0.024204	0.024192	0.025190	6.44e-03	5.95e-03	0.007381
12:	typeI	TRUE	FALSE	TRUE	5	0.001472	0.001451	0.001545	1.17e-03	1.21e-03	0.001552
13:	power	TRUE	FALSE	FALSE	10	0.014415	0.014146	0.015747	3.10e-03	2.68e-03	0.002008
14:	typeI	TRUE	FALSE	FALSE	10	0.000139	0.000139	0.000555	-1.53e-05	-2.18e-05	0.001472
15:	power	TRUE	FALSE	FALSE	5	0.023380	0.023344	0.024346	8.80e-03	8.79e-03	0.007463
16:	typeI	TRUE	FALSE	FALSE	5	0.000602	0.000602	0.000949	5.40e-04	5.00e-04	0.001079
17:	power	FALSE	TRUE	FALSE	5	0.022836	0.022825	0.023807	1.20e-02	1.21e-02	0.010058
18:	typeI	FALSE	TRUE	FALSE	5	-0.029516	-0.029722	-0.029915	-1.10e-02	-1.14e-02	-0.011615

Median bias [2] per estimator and method:

	hypo	missing	binding	fixC	ar	mbiasMLE1	mbiasMLE2	mbiasMLE3	mbiasMUE1	mbiasMUE2	mbiasMUE3
1:	power	TRUE	TRUE	FALSE	10	0.0250	0.0240	0.0266	-0.0023	-0.0017	-0.0062
2:	typeI	TRUE	TRUE	FALSE	10	-0.0193	-0.0198	-0.0223	0.0002	-0.0013	0.0001
3:	power	TRUE	TRUE	FALSE	5	0.0387	0.0382	0.0406	-0.0030	-0.0016	-0.0026
4:	typeI	TRUE	TRUE	FALSE	5	-0.0346	-0.0339	-0.0361	0.0000	-0.0002	0.0001
5:	power	TRUE	TRUE	TRUE	10	0.0164	0.0188	0.0179	-0.0134	-0.0128	-0.0102
6:	typeI	TRUE	TRUE	TRUE	10	-0.0327	-0.0314	-0.0347	-0.0113	-0.0079	-0.0099
7:	power	TRUE	TRUE	TRUE	5	0.0356	0.0369	0.0361	-0.0106	-0.0115	-0.0082
8:	typeI	TRUE	TRUE	TRUE	5	-0.0473	-0.0492	-0.0493	-0.0105	-0.0081	-0.0105
9:	power	TRUE	FALSE	TRUE	10	0.0328	0.0301	0.0345	-0.0092	-0.0110	-0.0055
10:	typeI	TRUE	FALSE	TRUE	10	0.0007	-0.0019	0.0007	0.0008	-0.0018	0.0030
11:	power	TRUE	FALSE	TRUE	5	0.0479	0.0459	0.0499	-0.0049	-0.0049	-0.0034
12:	typeI	TRUE	FALSE	TRUE	5	0.0009	-0.0017	0.0009	0.0009	-0.0017	0.0013
13:	power	TRUE	FALSE	FALSE	10	0.0326	0.0324	0.0339	-0.0033	-0.0036	-0.0005
14:	typeI	TRUE	FALSE	FALSE	10	-0.0039	-0.0039	-0.0037	-0.0039	-0.0039	-0.0015
15:	power	TRUE	FALSE	FALSE	5	0.0442	0.0442	0.0465	-0.0010	-0.0010	-0.0038
16:	typeI	TRUE	FALSE	FALSE	5	-0.0039	-0.0039	-0.0039	-0.0039	-0.0039	-0.0031
17:	power	FALSE	TRUE	FALSE	5	0.0383	0.0378	0.0400	-0.0026	-0.0008	-0.0046
18:	typeI	FALSE	TRUE	FALSE	5	-0.0329	-0.0336	-0.0353	0.0044	0.0031	0.0035

[1] e.g. `biasMLE1` mixed model estimator (treatment effect), method 1 (boundaries)

[2] Relative frequency at which the estimate is greater than the truth minus 0.5

4 Distribution of the estimates

Distribution of the estimates:

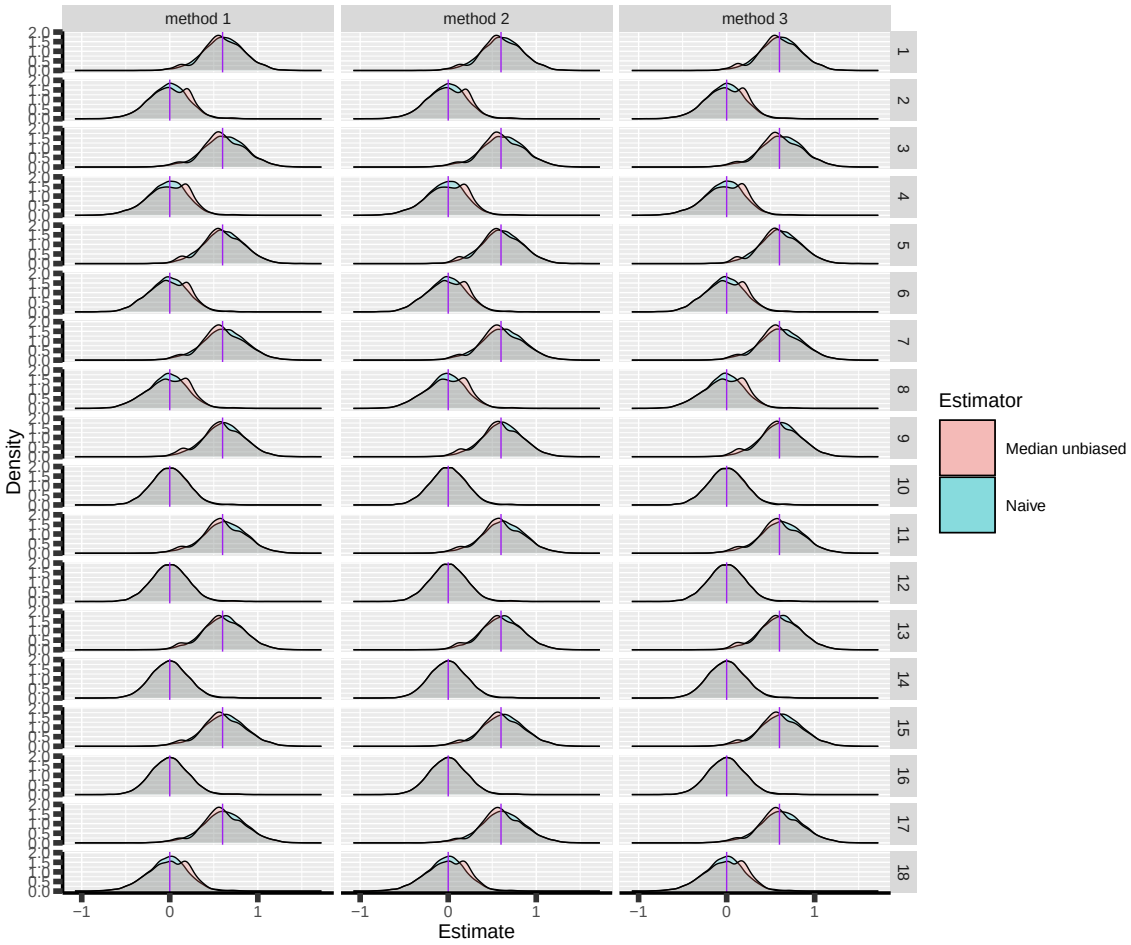

Figure 3: Naive and Median unbiased estimate distribution over all simulations. Each row correspond to a different scenario

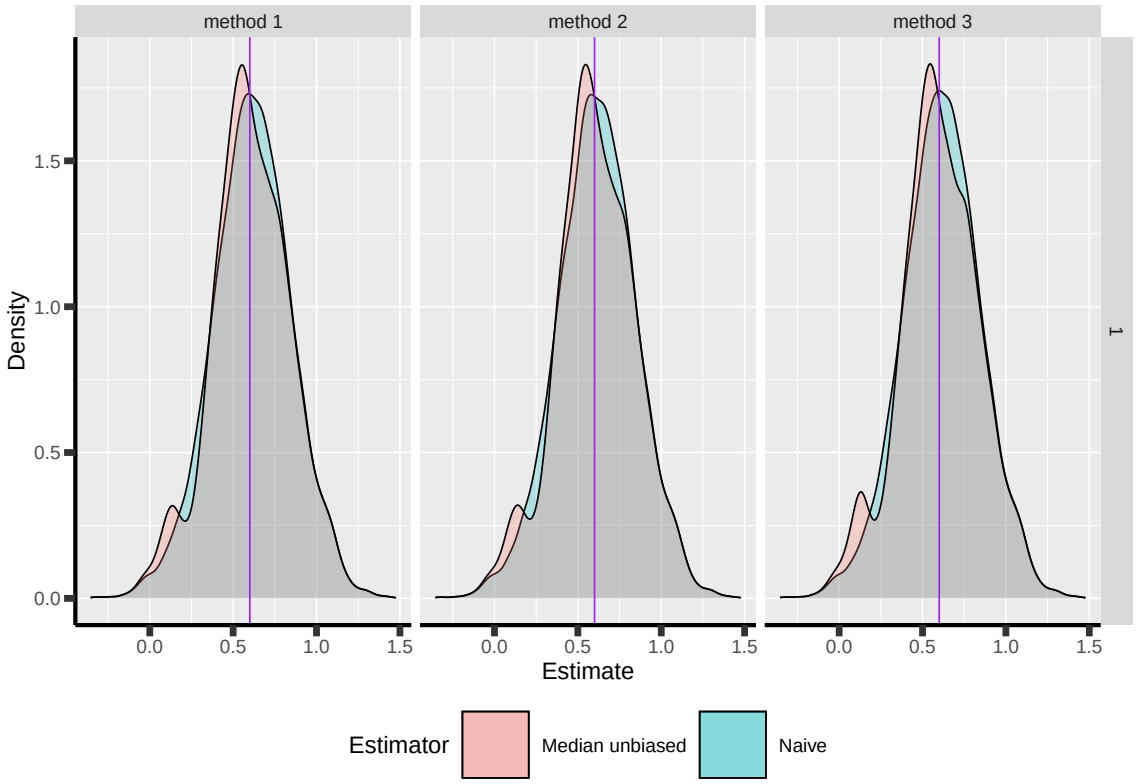

Figure 4: Same but specific to scenario 1

Distribution of the median unbiased estimate conditional to the stage:

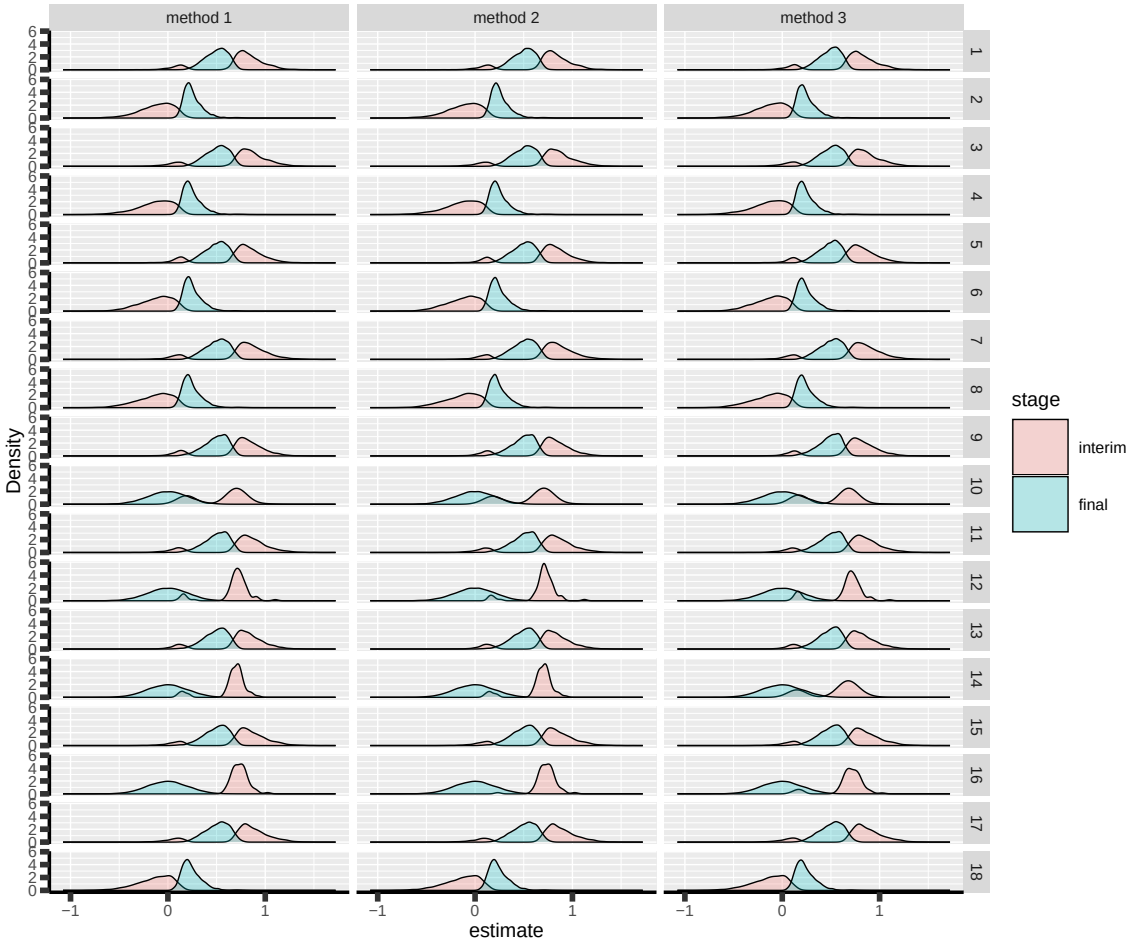

Figure 5: Median unbiased estimate distribution conditional to the stage. Each row correspond to a different scenario.

5 Special cases

Reason for stopping (first 4) or continuing the trial (last):

	scenario	1	2	3	4	5	6	7	8
reason	method								
decreasing information	1	0	0	1	1	0	0	0	0
	2	0	0	1	1	0	0	0	0
	3	0	0	1	1	0	0	0	0
efficacy	1	3740	77	3559	67	3696	82	3502	82
	2	3729	82	3554	68	3732	82	3546	83
	3	4137	107	3712	83	4071	110	3632	92
futility	1	646	7086	603	6922	600	7109	552	6901
	2	658	7120	611	6904	542	6981	523	6834
	3	560	6843	579	6822	495	6850	519	6812
Imax reached	1	1	1	0	0	2	2	0	0
	2	1	1	0	0	2	2	0	0
	3	1	1	0	0	2	2	0	0
no boundary crossed	1	5613	2836	5838	3011	5702	2807	5946	3017
	2	5612	2797	5835	3028	5724	2935	5931	3083
	3	5302	3049	5709	3095	5432	3038	5849	3096

	scenario	9	10	11	12	13	14	15	16
reason	method								
decreasing information	1	0	0	1	0	0	0	0	0
	2	0	0	1	0	0	0	0	0
	3	0	0	1	0	0	0	0	0
efficacy	1	3805	84	3634	82	3815	78	3674	67
	2	3824	81	3646	79	3816	78	3677	67
	3	4206	109	3761	88	4238	112	3788	83
futility	1	614	7130	596	6957	604	7126	571	6920
	2	572	7044	571	6907	628	7180	573	6925
	3	535	6914	561	6867	514	6870	535	6837
Imax reached	1	1	1	0	0	0	0	0	0
	2	1	1	0	0	0	0	0	0
	3	1	1	0	0	0	0	0	0
no boundary crossed	1	5580	2785	5770	2961	5581	2796	5755	3013
	2	5603	2874	5783	3014	5556	2742	5750	3008
	3	5258	2976	5678	3045	5248	3018	5677	3080

6 Reversal probability

Percentage of time we observe a reversal:

	N	hypo	missing	ar	binding	fixC	fu2eff_1	fu2eff_2	fu2eff_3	eff2fu_1	eff2fu_2	eff2fu_3
1:	10000	power	FALSE	5	TRUE	FALSE	0.06	0.07	0.01	0.04	0.04	0.63
2:	10000	power	TRUE	5	FALSE	FALSE	0.04	0.04	0.00	0.03	0.03	0.51
3:	10000	power	TRUE	5	FALSE	TRUE	0.04	0.03	0.03	0.36	0.42	0.56
4:	10000	power	TRUE	5	TRUE	FALSE	0.06	0.08	0.02	0.05	0.07	0.65
5:	10000	power	TRUE	5	TRUE	TRUE	0.02	0.02	0.01	0.36	0.42	0.63
6:	10000	power	TRUE	10	FALSE	FALSE	0.35	0.38	0.05	0.18	0.21	0.96
7:	10000	power	TRUE	10	FALSE	TRUE	0.15	0.13	0.10	0.63	0.61	1.13
8:	10000	power	TRUE	10	TRUE	FALSE	0.57	0.57	0.13	0.15	0.20	1.06
9:	10000	power	TRUE	10	TRUE	TRUE	0.17	0.16	0.11	0.70	0.68	0.99
10:	10000	typeI	FALSE	5	TRUE	FALSE	0.01	0.03	0.00	0.01	0.03	0.12
11:	10000	typeI	TRUE	5	FALSE	FALSE	0.00	0.00	0.00	0.00	0.01	0.08
12:	10000	typeI	TRUE	5	FALSE	TRUE	0.00	0.00	0.00	0.09	0.07	0.14
13:	10000	typeI	TRUE	5	TRUE	FALSE	0.02	0.02	0.00	0.01	0.03	0.15
14:	10000	typeI	TRUE	5	TRUE	TRUE	0.00	0.00	0.00	0.10	0.12	0.14
15:	10000	typeI	TRUE	10	FALSE	FALSE	0.00	0.00	0.00	0.09	0.09	0.31
16:	10000	typeI	TRUE	10	FALSE	TRUE	0.00	0.00	0.00	0.27	0.25	0.37
17:	10000	typeI	TRUE	10	TRUE	FALSE	0.11	0.11	0.03	0.09	0.08	0.36
18:	10000	typeI	TRUE	10	TRUE	TRUE	0.02	0.00	0.00	0.22	0.21	0.39

7 Frequency mismatch p-value / boundaries

When concluding for futility:

	hypo	missing	ar	binding	fixC	method 1	method 2	method 3
1:	power	FALSE	5	TRUE	FALSE	0	0	0
2:	power	TRUE	5	FALSE	FALSE	0	0	0
3:	power	TRUE	5	FALSE	TRUE	0	0	0
4:	power	TRUE	5	TRUE	FALSE	0	0	0
5:	power	TRUE	5	TRUE	TRUE	0	0	0
6:	power	TRUE	10	FALSE	FALSE	0	0	0
7:	power	TRUE	10	FALSE	TRUE	0	0	0
8:	power	TRUE	10	TRUE	FALSE	0	0	0
9:	power	TRUE	10	TRUE	TRUE	0	0	0
10:	typeI	FALSE	5	TRUE	FALSE	0	0	0
11:	typeI	TRUE	5	FALSE	FALSE	0	0	0
12:	typeI	TRUE	5	FALSE	TRUE	0	0	0
13:	typeI	TRUE	5	TRUE	FALSE	0	0	0
14:	typeI	TRUE	5	TRUE	TRUE	0	0	0
15:	typeI	TRUE	10	FALSE	FALSE	0	0	0
16:	typeI	TRUE	10	FALSE	TRUE	0	0	0
17:	typeI	TRUE	10	TRUE	FALSE	0	0	0
18:	typeI	TRUE	10	TRUE	TRUE	0	0	0

When concluding for efficacy:

	hypo	missing	ar	binding	fixC	method 1	method 2	method 3
1:	power	FALSE	5	TRUE	FALSE	0	0	0
2:	power	TRUE	5	FALSE	FALSE	0	0	0
3:	power	TRUE	5	FALSE	TRUE	0	0	0
4:	power	TRUE	5	TRUE	FALSE	0	0	0
5:	power	TRUE	5	TRUE	TRUE	0	0	0
6:	power	TRUE	10	FALSE	FALSE	0	0	0
7:	power	TRUE	10	FALSE	TRUE	0	0	0
8:	power	TRUE	10	TRUE	FALSE	0	0	0
9:	power	TRUE	10	TRUE	TRUE	0	0	0
10:	typeI	FALSE	5	TRUE	FALSE	0	0	0
11:	typeI	TRUE	5	FALSE	FALSE	0	0	0
12:	typeI	TRUE	5	FALSE	TRUE	0	0	0
13:	typeI	TRUE	5	TRUE	FALSE	0	0	0
14:	typeI	TRUE	5	TRUE	TRUE	0	0	0
15:	typeI	TRUE	10	FALSE	FALSE	0	0	0
16:	typeI	TRUE	10	FALSE	TRUE	0	0	0
17:	typeI	TRUE	10	TRUE	FALSE	0	0	0
18:	typeI	TRUE	10	TRUE	TRUE	0	0	0

8 Percentage of missing values

Here only for method 1 - values are very similar between different methods:

- `pc.all` percentage of observations with full data
- `pc.missing3` percentage of observations missing the final outcome but with intermediate outcome value and baseline.
- `pc.missing23` percentage of observations with only baseline value

	method	missing	ar	hypo	fixC	binding	N	pc.all	pc.missing3	pc.missing23
1:	1	TRUE	5	power	FALSE	TRUE	10000	79.53472	9.562374	10.902910
2:	1	TRUE	5	typeI	FALSE	TRUE	10000	79.53472	9.562374	10.902910
3:	1	TRUE	5	power	TRUE	TRUE	10000	79.44022	9.531225	11.028558
4:	1	TRUE	5	typeI	TRUE	TRUE	10000	79.44022	9.531225	11.028558
5:	1	TRUE	5	power	TRUE	FALSE	10000	79.71917	9.427430	10.853396
6:	1	TRUE	5	typeI	TRUE	FALSE	10000	79.71917	9.427430	10.853396
7:	1	TRUE	5	power	FALSE	FALSE	10000	79.64196	9.449136	10.908902
8:	1	TRUE	5	typeI	FALSE	FALSE	10000	79.64196	9.449136	10.908902
9:	1	FALSE	5	power	FALSE	TRUE	10000	87.78863	6.090240	6.121126
10:	1	FALSE	5	typeI	FALSE	TRUE	10000	87.78863	6.090240	6.121126
11:	1	TRUE	10	power	FALSE	TRUE	10000	71.60971	13.327969	15.062319
12:	1	TRUE	10	typeI	FALSE	TRUE	10000	71.60971	13.327969	15.062319
13:	1	TRUE	10	power	TRUE	TRUE	10000	71.52189	13.282615	15.195496
14:	1	TRUE	10	typeI	TRUE	TRUE	10000	71.52189	13.282615	15.195496
15:	1	TRUE	10	power	TRUE	FALSE	10000	71.85935	13.144488	14.996166
16:	1	TRUE	10	typeI	TRUE	FALSE	10000	71.85935	13.144488	14.996166
17:	1	TRUE	10	power	FALSE	FALSE	10000	71.79364	13.168843	15.037522
18:	1	TRUE	10	typeI	FALSE	FALSE	10000	71.79364	13.168843	15.037522

9 Information

Percentage of information for method 1[3]:

scenario	missing	binding	fixC	ar	interim	decision	final
1	TRUE	TRUE	FALSE	10	54.63862	63.33698	102.69943
2	TRUE	TRUE	FALSE	10	54.63862	68.96135	102.32310
3	TRUE	TRUE	FALSE	5	53.27109	57.38550	102.74966
4	TRUE	TRUE	FALSE	5	53.27109	60.22345	102.34459
5	TRUE	TRUE	TRUE	10	54.54008	63.10923	102.78945
6	TRUE	TRUE	TRUE	10	54.54008	68.95137	102.12003
7	TRUE	TRUE	TRUE	5	53.17744	57.18426	102.80673
8	TRUE	TRUE	TRUE	5	53.17744	60.12266	102.22328
9	TRUE	FALSE	TRUE	10	54.51044	63.16647	102.56935
10	TRUE	FALSE	TRUE	10	54.51044	54.66970	103.09893
11	TRUE	FALSE	TRUE	5	53.17317	57.27740	102.61166
12	TRUE	FALSE	TRUE	5	53.17317	53.24797	103.10060
13	TRUE	FALSE	FALSE	10	54.49750	63.16580	102.56590
14	TRUE	FALSE	FALSE	10	54.49750	54.64468	103.12067
15	TRUE	FALSE	FALSE	5	53.15611	57.29003	102.60917
16	TRUE	FALSE	FALSE	5	53.15611	53.21806	103.12463
17	FALSE	TRUE	FALSE	5	52.06840	56.28978	99.96969
18	FALSE	TRUE	FALSE	5	52.06840	59.42197	99.62860

Similar results for other methods.

[3] average over the reached stages