

	DX_GROUP	variable	includedMedian	excludedMedian	U	p.fdr
1	TD	AGE	10.40	9.86	4564.00	0.30
2	TD	FIQ	116.00	114.00	4532.50	0.30
3	ASD	ADOS	13.00	12.00	2326.00	0.67
4	ASD	AGE	10.48	9.96	2537.50	0.30
5	ASD	FIQ	102.50	105.00	2103.50	0.67

Table S1: **Summary of Mann-Whitney U tests comparing included and excluded participants using the Ciric motion QC and stratified by primary diagnosis.**

	DX_GROUP	variable	includedMedian	excludedMedian	U	p.fdr
1	TD	AGE	10.56	10.29	8291.50	0.81
2	TD	FIQ	116.00	115.00	8179.50	0.81
3	ASD	ADOS	13.00	13.00	1964.00	0.84
4	ASD	AGE	10.27	10.33	1878.00	0.81
5	ASD	FIQ	100.00	104.50	1605.50	0.84

Table S2: **Summary of Mann-Whitney U tests comparing included and excluded participants using the Powerpt2 motion QC and stratified by primary diagnosis.**

samplesize	naive	drtmle	aipwe	perm aipwe	ind naive	ind perm sandwich
100	0.0545	0.2913	0.0849	0.0740	0.0413	0.0802
200	0.0487	0.2094	0.0708	0.0693	0.0295	0.0715
500	0.0497	0.1469	0.0570	0.0541	0.0249	0.0556
1000	0.0457	0.1235	0.0517	0.0507	0.0206	0.0482

Table S3: Type 1 errors in simulation setting 1 (single region).

samplesize	naive	drtmle	aipwe	perm aipwe	ind naive	ind perm sandwich
100	0.0518	0.3530	0.3446	0.3289	0.0398	0.3301
200	0.0676	0.6002	0.6643	0.6473	0.0556	0.6437
500	0.0923	0.9444	0.9680	0.9657	0.0781	0.9680
1000	0.1351	0.9970	0.9995	0.9995	0.0989	0.9995

Table S4: Power for different tests in simulation setting 1 (single region).

samplesize	naive.bon	naive.BH	drtmle.bon	drtmle.BH	aipwe.bon	aipwe.BH	max_perm aipwe	max_perm sandwich
100	0.0002	0.0049	0.0540	0.1510	0.0047	0.0186	0.0100	0.0099
200	0.0006	0.0060	0.0363	0.0961	0.0026	0.0125	0.0078	0.0080
500	0.0007	0.0046	0.0238	0.0629	0.0014	0.0091	0.0053	0.0054
1000	0.0005	0.0058	0.0189	0.0499	0.0011	0.0095	0.0053	0.0053

Table S5: **False discovery rate in simulation setting 2 (strong block-wise correlation between 81 regions).**

samplesize	naive.bon	naive.BH	drtmle.bon	drtmle.BH	aipwe.bon	aipwe.BH	max_perm aipwe	max_perm sandwich
100	0.0124	0.0225	0.4506	0.5090	0.0787	0.0966	0.1404	0.1371
200	0.0144	0.0258	0.3196	0.3691	0.0464	0.0670	0.1072	0.1113
500	0.0081	0.0234	0.2680	0.3289	0.0284	0.0467	0.0853	0.0812
1000	0.0102	0.0255	0.2939	0.3398	0.0235	0.0449	0.0704	0.0653

Table S6: **Family-wise error rate in simulation setting 2 (strong block-wise correlation between 81 regions).**

samplesize	naive.bon	naive.BH	drtmle.bon	drtmle.BH	aipwe.bon	aipwe.BH	max_perm aipwe	max_perm sandwich
100	0.0416	0.0438	0.2933	0.3787	0.1427	0.1562	0.2427	0.2393
200	0.2124	0.2196	0.4649	0.5351	0.4041	0.4155	0.5330	0.5412
500	0.8081	0.8122	0.8873	0.9107	0.9036	0.9076	0.9543	0.9553
1000	0.9949	0.9990	0.9857	0.9908	0.9980	1.0000	1.0000	1.0000

Table S7: **Power in simulation setting 2 (strong block-wise correlation between 81 regions).**

samplesize	naive.bon	naive.BH	drtmle.bon	drtmle.BH	aipwe.bon	aipwe.BH	max_perm aipwe	max_perm sandwich
100	0.0007	0.0015	0.0532	0.1421	0.0049	0.0105	0.0044	0.0046
200	0.0006	0.0014	0.0362	0.0876	0.0028	0.0063	0.0030	0.0030
500	0.0006	0.0021	0.0282	0.0616	0.0020	0.0053	0.0023	0.0023
1000	0.0006	0.0022	0.0209	0.0449	0.0015	0.0045	0.0019	0.0019

Table S8: **False discovery rate for simulation setting 3 (correlations between regions based on seed-based data analysis, weaker correlation).**

samplesize	naive.bon	naive.BH	drtmle.bon	drtmle.BH	aipwe.bon	aipwe.BH	max_perm aipwe	max_perm sandwich
100	0.0395	0.0429	0.6486	0.6904	0.2294	0.2554	0.2124	0.2158
200	0.0321	0.0445	0.5300	0.5890	0.1480	0.1977	0.1563	0.1594
500	0.0355	0.0599	0.4416	0.5462	0.1086	0.1553	0.1239	0.1208
1000	0.0379	0.0676	0.4371	0.5251	0.0809	0.1279	0.1044	0.1044

Table S9: **Family-wise error rate for simulation setting 3 (correlations between regions based on real data analysis, weaker correlation).**

samplesize	naive.bon	naive.BH	drtmle.bon	drtmle.BH	aipwe.bon	aipwe.BH	max_perm aipwe	max_perm sandwich
100	0.0475	0.0497	0.2949	0.4226	0.1480	0.1774	0.1446	0.1435
200	0.2050	0.2101	0.4762	0.5797	0.3934	0.4213	0.4048	0.4017
500	0.7990	0.8030	0.8924	0.9168	0.9117	0.9178	0.9198	0.9208
1000	0.9980	0.9990	0.9908	0.9928	1.0000	1.0000	1.0000	1.0000

Table S10: **Power in simulation setting 3 (correlations between regions based on real data analysis, weaker correlation).**