

S2 Table: Scenario I: Comparison of PLACO and GPA in terms of error control and power for 2 independent case-control studies, where Study 1 has 4 times sample size as Study 2, and Study 2 has 1,000 unrelated cases and 1,000 unrelated controls. Each study has 9.9×10^6 null variants (i.e., variants under H_{00} or H_{01} or H_{02}) and m non-null (pleiotropic) variants, where m takes values 0, 100, 300, 500, 1000, 3000, 5000 or 10000. Five different choices of odds ratios of association of m non-null variants with Traits 1 and 2 are considered. The total number of true positives (non-null variants) detected (#TP) and the total number of false positives detected (#FP) are reported. PLACO's performance for both genome-wide threshold 5×10^{-8} (or equivalently family-wise error rate (FWER) of 5%) and global false discovery rate (FDR) of 5% are reported, while GPA's performance is based on global FDR of 5%.

OR	Simulation type		PLACO				GPA	
	# null SNPs	# non-null SNPs	FWER 5%		FDR 5%		FDR 5%	
			#TP	#FP	#TP	#FP	#TP	#FP
(1.5, 1.5)	9.9×10^6	0	0	0	0	0	0	0
	9.9×10^6	100	60	0	68	5	1	0
	9.9×10^6	300	185	0	239	19	163	2
	9.9×10^6	500	310	0	408	30	471	66
	9.9×10^6	1000	611	0	859	56	981	287
	9.9×10^6	3000	1807	0	2645	142	2968	584
	9.9×10^6	5000	3024	0	4518	224	4964	882
	9.9×10^6	10^4	6004	0	9164	456	9942	1595
(1.7, 1.7)	9.9×10^6	0	0	0	0	0	0	0
	9.9×10^6	100	94	0	99	8	76	0
	9.9×10^6	300	284	0	298	22	300	76
	9.9×10^6	500	472	0	497	34	500	107
	9.9×10^6	1000	961	0	996	63	1000	182
	9.9×10^6	3000	2906	0	2991	156	3000	440
	9.9×10^6	5000	4854	0	4985	247	5000	676
	9.9×10^6	10^4	9711	0	9974	499	10000	1238
(1.5, 1/1.5)	9.9×10^6	0	0	0	0	0	0	0
	9.9×10^6	100	51	0	59	4	0	0
	9.9×10^6	300	146	0	189	16	286	124
	9.9×10^6	500	243	0	337	27	486	258
	9.9×10^6	1000	493	0	737	54	973	309
	9.9×10^6	3000	1385	0	2331	126	2947	610
	9.9×10^6	5000	2294	0	4043	206	4932	906
	9.9×10^6	10^4	4571	0	8416	422	9916	1627
(1.7, 1/1.7)	9.9×10^6	0	0	0	0	0	0	0
	9.9×10^6	100	87	0	92	6	98	5
	9.9×10^6	300	264	0	284	21	300	90
	9.9×10^6	500	444	0	480	32	500	121
	9.9×10^6	1000	890	0	970	61	1000	202
	9.9×10^6	3000	2672	0	2936	155	3000	479
	9.9×10^6	5000	4466	0	4908	243	5000	731
	9.9×10^6	10^4	8929	0	9858	495	10000	1329
(1.7, 1.2)	9.9×10^6	0	0	0	0	0	0	0
	9.9×10^6	100	24	0	27	2	0	0
	9.9×10^6	300	64	0	90	5	300	175
	9.9×10^6	500	112	0	171	15	500	189
	9.9×10^6	1000	218	0	377	29	1000	277
	9.9×10^6	3000	688	0	1348	79	3000	606
	9.9×10^6	5000	1120	0	2414	128	5000	906
	9.9×10^6	10^4	2317	0	5276	257	10000	1606

denotes total number (e.g. #TP denotes total number of true positives detected).