

Supplemental Data

Random-Effects Model Aimed at Discovering Associations in Meta-Analysis of Genome-wide Association Studies

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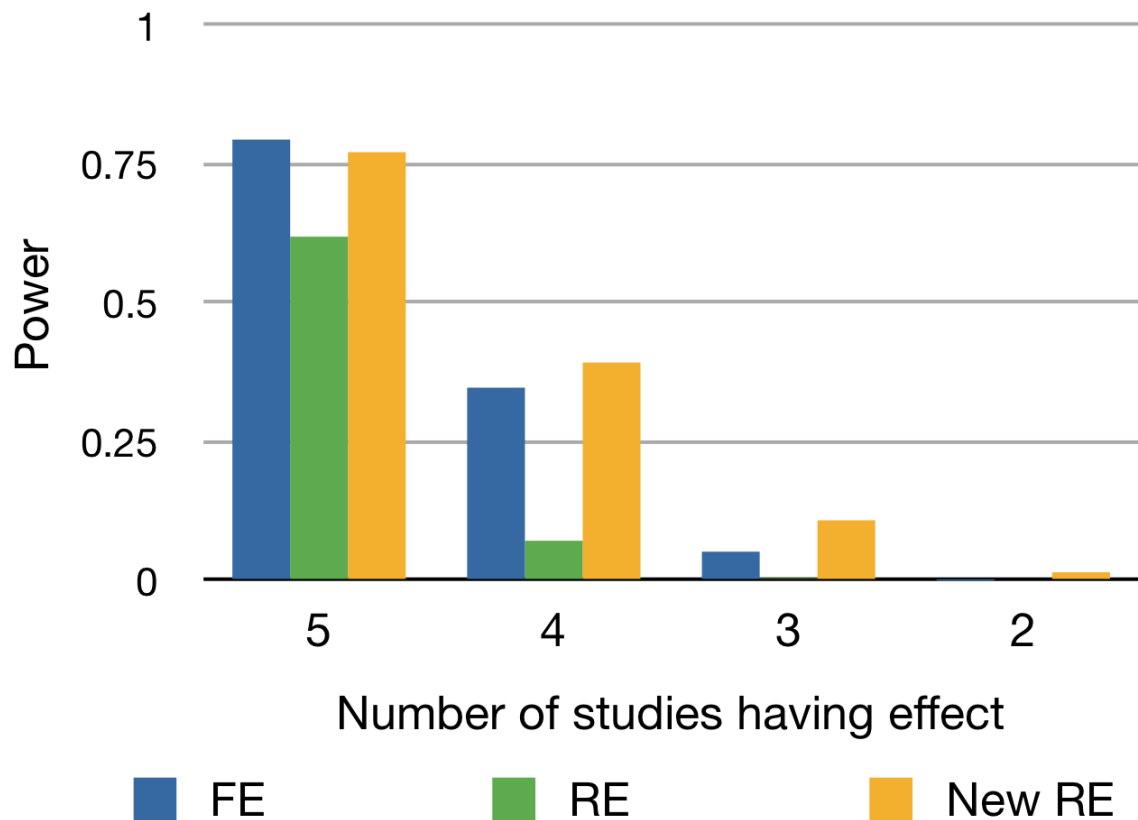


Figure S1:

Power of FE, RE, and our new RE method when the number of studies having effect varies from 5 to 2 among 5 studies in a meta-analysis. We assume equal sample size of 1000. Unlike Figure 5 in the main manuscript, we fixed odds ratio to 1.3 instead of increasing odds ratio as the number of studies having effect decreases. As a result, for each method, the power decreases as the number of studies having effect decreases, as it should.

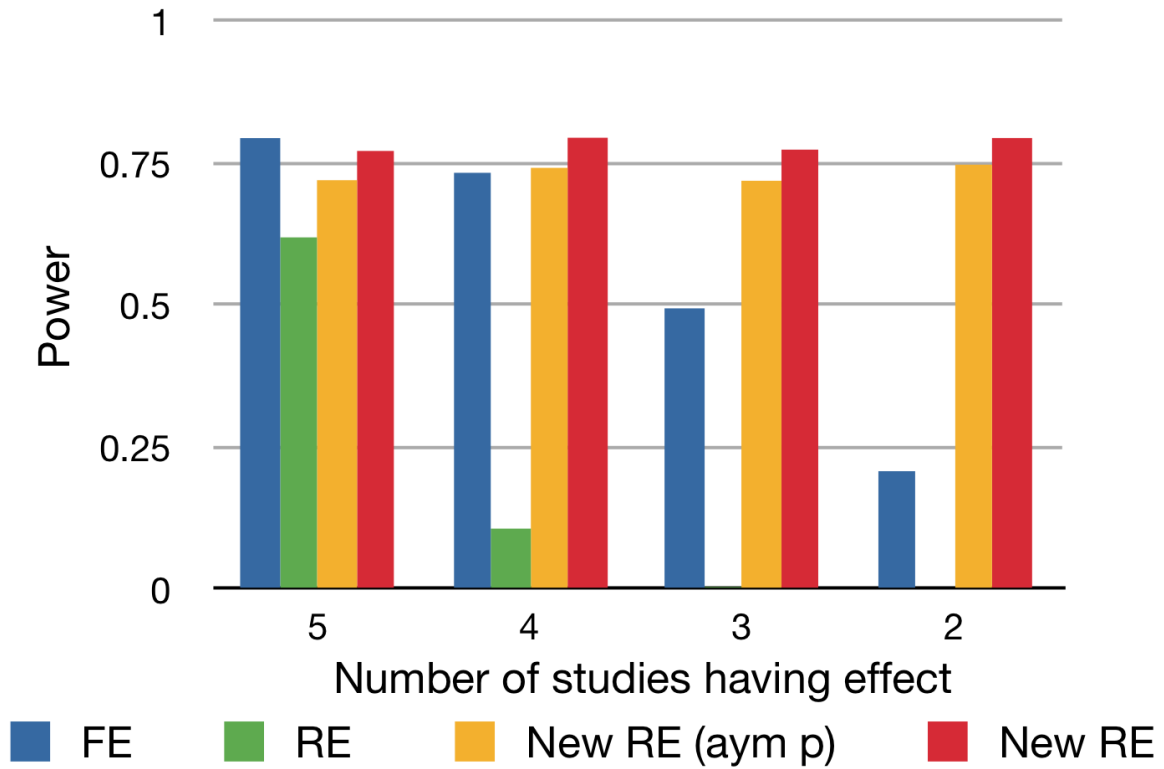


Figure S2:
 Power of different methods when the number of studies having effect varies from 5 to 2 among 5 studies in a meta-analysis. We assume equal sample size of 1000. Unlike Figure 5 in the main manuscript, we additionally plot the power of New RE method with the p-values estimated using the asymptotic distribution. This shows that a considerable amount of power can be lost using the asymptotic approximation instead of our accurate estimation.

rsIDs	Chr	Position	FE p-value	RE p-value	New RE p-value	I ²
rs2797685	1	7,801,650	3.25E-10	3.68E-06	6.35E-10	32.02
rs11209026	1	67,478,546	8.57E-59	8.57E-59	3.94E-58	0
rs2476601	1	114,179,091	8.54E-09	6.92E-06	1.46E-08	22.31
rs1142287	1	153,496,755	1.20E-09	7.01E-06	1.37E-09	37.34
rs4656940	1	159,096,892	1.05E-06	6.89E-04	6.91E-07	57.01
rs7517810	1	171,120,083	9.19E-16	9.19E-16	2.22E-15	0
rs1998598	1	195,994,265	6.13E-09	6.13E-09	1.12E-08	0
rs7554511	1	199,144,185	2.81E-07	5.22E-07	4.00E-07	2.82
rs3024505	1	205,006,527	7.03E-09	5.30E-05	5.50E-09	46.49
rs13428812	2	25,345,971	4.01E-08	4.01E-08	7.39E-08	0
rs780093	2	27,596,107	1.13E-04	5.95E-02	2.78E-05	61.85
rs10495903	2	43,660,422	7.59E-08	7.59E-08	1.40E-07	0
rs10181042	2	61,077,763	7.28E-09	7.28E-09	1.33E-08	0
rs2058660	2	102,420,881	1.45E-12	1.45E-12	3.13E-12	0
rs6738825	2	198,605,140	2.05E-07	2.05E-07	3.72E-07	0
rs7423615	2	230,825,118	8.80E-09	5.00E-07	1.17E-08	21.14
rs3792109	2	233,849,156	2.45E-40	3.38E-32	9.36E-40	12.81
rs13073817	3	18,681,862	8.99E-07	1.71E-04	1.59E-06	36.71
rs3197999	3	49,696,536	3.40E-17	3.40E-17	8.60E-17	0
rs11742570	5	40,446,341	1.62E-35	6.48E-16	3.93E-35	49.11
rs7702331	5	72,586,890	3.61E-06	3.82E-04	6.12E-06	43.55
rs2549794	5	96,270,305	4.35E-11	2.78E-07	7.64E-11	24.21
rs12521868	5	131,812,292	8.29E-21	2.07E-15	2.30E-20	19.91
rs11167764	5	141,459,249	1.51E-09	6.03E-09	2.86E-09	3.93
rs7714584	5	150,250,613	1.32E-18	3.40E-14	2.55E-18	23.32
rs6556412	5	158,719,963	1.93E-13	2.26E-07	3.71E-13	39.85
rs359457	5	173,212,448	5.33E-08	2.58E-07	9.70E-08	7.28
rs17309827	6	3,378,317	5.62E-06	1.00E-04	4.99E-06	22.98
rs6908425	6	20,836,710	1.36E-08	1.36E-08	2.40E-08	0
rs1799964	6	31,650,287	4.55E-11	4.55E-11	9.23E-11	0
rs1847472	6	91,029,880	4.10E-06	3.07E-05	7.21E-06	14.32
rs6568421	6	106,541,718	4.78E-07	4.78E-07	8.40E-07	0
rs212388	6	159,410,424	5.20E-07	5.20E-07	9.18E-07	0
rs415890	6	167,326,623	3.26E-12	5.25E-08	3.65E-12	42.31
rs1456896	7	50,275,007	1.28E-07	1.06E-06	2.27E-07	6.11
rs4871611	8	126,606,752	1.39E-12	1.39E-12	3.01E-12	0
rs6651252	8	129,636,363	3.26E-06	1.29E-05	5.24E-06	11.16
rs10758669	9	4,971,602	4.84E-13	4.84E-13	1.07E-12	0
rs3810936	9	116,592,706	2.64E-14	2.64E-14	6.10E-14	0
rs4077515	9	138,386,317	5.41E-18	1.28E-13	1.40E-17	19.62
rs12722489	10	6,142,018	1.09E-05	1.09E-05	1.89E-05	0
rs12242110	10	35,575,701	1.73E-09	1.73E-09	3.27E-09	0
rs1819658	10	59,583,157	2.30E-07	2.30E-07	4.17E-07	0
rs10761659	10	64,115,570	3.67E-21	4.30E-13	1.03E-20	29.94
rs1250550	10	80,730,323	1.24E-09	1.94E-05	2.03E-09	40.3
rs4409764	10	101,274,227	9.32E-20	9.32E-20	2.52E-19	0

rs102275	11	61,314,379	7.10E-08	1.03E-07	1.30E-07	1.73
rs7927997	11	75,979,023	2.57E-12	2.57E-12	5.50E-12	0
rs11564258	12	39,078,567	8.03E-21	1.32E-10	1.99E-20	41.59
rs2062305	13	41,950,880	2.80E-06	2.80E-06	4.95E-06	0
rs3764147	13	43,355,925	1.99E-10	1.99E-10	3.94E-10	0
rs4902642	14	68,279,952	4.57E-07	4.57E-07	8.01E-07	0
rs8005161	14	87,542,348	1.28E-08	9.68E-08	2.38E-08	5.86
rs17293632	15	65,229,650	6.17E-13	2.11E-06	3.42E-13	52.11
rs151181	16	28,398,018	3.32E-10	3.81E-06	3.09E-10	35.22
rs2076756	16	49,314,382	6.61E-72	4.58E-44	3.10E-71	34.15
rs3091315	17	29,617,778	2.25E-13	2.25E-13	5.01E-13	0
rs2872507	17	35,294,289	1.64E-09	1.64E-09	3.09E-09	0
rs11871801	17	37,824,298	5.71E-08	9.58E-07	1.04E-07	10.2
rs1893217	18	12,799,340	1.49E-14	1.49E-14	3.46E-14	0
rs740495	19	1,075,835	3.58E-09	3.58E-09	6.64E-09	0
rs12720356	19	10,330,975	1.90E-08	1.90E-08	3.30E-08	0
rs281379	19	53,906,086	1.23E-08	1.05E-06	1.77E-08	28.44
rs4809330	20	61,820,030	2.86E-12	2.86E-12	6.11E-12	0
rs1736020	21	15,734,423	1.82E-11	1.82E-11	3.76E-11	0
rs2838519	21	44,439,451	4.01E-14	8.42E-12	9.20E-14	12.75
rs181359	22	20,258,641	7.91E-13	7.91E-13	1.73E-12	0
rs713875	22	28,922,487	1.01E-08	5.67E-05	1.76E-08	34.64
rs2413583	22	37,989,719	1.10E-09	1.10E-09	2.09E-09	0

Table S1:

Application of the three meta-analysis methods to the Crohn's disease meta-analysis results of Franke et al.. The boldface denotes the top p-value among three methods. The results of all 69 SNPs are presented.