

Table S-8. Power analyses, replication datasets.

Condition	Type I error (α)	Quanto		Simulated					
				Fast epistasis			BOOST		
		OR = 1.25	OR = 1.50	f = 0.15	f = 0.20	f = 0.25	f = 0.15	f = 0.20	f = 0.25
Allergic rhinitis Cases = 976 Controls = 3,004 Prev = 0.25 b = 0.243, 0.241, 0.238	0.05	0.363	0.845	0.66	0.90	0.99	0.46	0.81	0.94
Asthma Cases = 988 Controls = 3,028 Prev = 0.15 b = 0.146, 0.144, 0.143	0.05	0.366	0.856	0.49	0.77	0.92	0.28	0.57	0.80
Cardiac disease Cases = 1,004 Controls = 3,013 Prev = 0.25 b = 0.243, 0.241, 0.239	0.05	0.366	0.848	0.75	0.96	0.99	0.54	0.85	0.98
Depression Cases = 978 Controls = 2,992 Prev = 0.15 b = 0.146, 0.145, 0.143	0.05	0.367	0.857	0.48	0.69	0.90	0.33	0.54	0.74
Dermatophytosis Cases = 989 Controls = 2,936 Prev = 0.15 b = 0.146, 0.145, 0.143	0.05	0.368	0.857	0.53	0.77	0.91	0.29	0.56	0.79
Diabetes, type 2 Cases = 986 Controls = 2,943 Prev = 0.15 b = 0.146, 0.145, 0.143	0.05	0.367	0.857	0.42	0.66	0.90	0.29	0.44	0.76
Dyslipidaemia Cases = 986 Controls = 2,997 Prev = 0.55 b = 0.535	0.05	0.343	0.802	1.00	N/A	N/A	1.00	N/A	N/A
Hemorrhoids Cases = 1,006 Controls = 3,117 Prev = 0.15 b = 0.146, 0.145, 0.143	0.05	0.351	0.812	0.63	0.80	0.93	0.44	0.72	0.86
Hypertensive disease Cases = 984 Controls = 3,036 Prev = 0.50 b = 0.485	0.05	0.347	0.809	1.00	N/A	N/A	0.98	N/A	N/A
Osteoarthritis Cases = 961 Controls = 2,985 Prev = 0.40 b = 0.389, 0.385, 0.381	0.05	0.346	0.814	0.93	1.00	1.00	0.82	0.98	1.00

f: relative penetrance. b: baseline penetrance, corresponding to each respective relative penetrance going from left to right. Green indicates power > 80%. N/A: not estimated because a model penetrance would exceed 1.0.