

Supplementary materials

Table S1. Sources of data for the analysis.

Phenotype	Author, published year	Population	Cases	PMID
AgeSmk	Liu, et al, 2019	European	341,257 European people and 11,894,779 SNPs	30643251
SmkInt	Liu, et al, 2019	European	607,291 European people and 11,802,365 SNPs	30643251
CigDay	Liu, et al, 2019	European	337,334 European people and 11913,712 SNPs	30643251
DrnkWk	Liu, et al, 2019	European	335,394 European people and 11,887,865 SNPs	30643251
Teacon	Pirastu et al, 2022	European	434,171 European people and 5,733,790 SNPs	35653391
Cofcon	Elsworth et al, 2018	European	64,949 European people and 9,851,867 SNPs	NA
Gout	NA	European	207,122 European people and 16,380,433 SNPs	NA

Table S2. Detailed information for instrumental variables of AgeSmk and association with gout.

Sort	SNP	A1	A2	Chr	Position	EAF	Beta	SE	Pval	R2	F
1	rs10200107	A	G	2	63613544	0.558	-0.01956	0.0258	1.84E-12	0.000189	64.37922
2	rs11780471	A	G	8	27344719	0.0644	0.03785	0.0503	7.00E-11	0.000173	58.90485
3	rs11915747	G	C	3	85699040	0.354	0.02099	0.0255	3.83E-13	0.000202	68.74888
4	rs140485736	A	G	15	75360268	0.0131	0.065453	0.105	1.41E-08	0.000111	37.79785
5	rs319748	A	G	17	31554533	0.711	-0.01703	0.0281	3.08E-08	0.000119	40.68674
6	rs3768886	C	G	2	2.25E+08	0.328	0.01714	0.027	7.37E-09	0.00013	44.19037
7	rs624833	G	T	4	2881256	0.309	0.017295	0.026	8.61E-09	0.000128	43.58189

SNP, single nucleotide polymorphisms; A1, effect allele; A2, other allele; Chr, chromosome; EAF, effect allele frequency; SE, standard error

Table S3. Detailed information for instrumental variables of SmkInt and association with gout.

Sort	SNP	A1	A2	Chr	Position	EAF	Beta	SE	Pval	R2	F
1	rs10001365	A	G	4	1.48E+08	0.405	-0.02499	0.0252	6.65E-12	0.000301	182.8619
2	rs10114490	A	G	9	11071160	0.198	-0.02551	0.0284	1.81E-08	0.000207	125.5854
3	rs10159545	G	C	10	21766969	0.375	0.02625	0.026	1.84E-12	0.000323	196.218
4	rs10233018	G	A	7	1.18E+08	0.503	0.027069	0.0254	2.75E-14	0.000366	222.5632
5	rs10260968	A	G	7	1889773	0.597	-0.02032	0.0251	1.75E-08	0.000199	120.7023
6	rs10279261	A	G	7	1.34E+08	0.619	-0.02142	0.026	5.00E-09	0.000216	131.4467
7	rs10498846	T	C	6	67405337	0.473	0.02061	0.025	6.62E-09	0.000212	128.6346
8	rs1050847	T	C	16	87443734	0.505	-0.02162	0.025	1.67E-09	0.000234	141.9905
9	rs10905461	C	T	10	8803551	0.718	-0.02396	0.0342	7.35E-09	0.000232	141.1584
10	rs11057005	G	A	12	16748721	0.43	-0.02093	0.0251	4.85E-09	0.000215	130.4344
11	rs11078713	G	A	17	7795972	0.454	-0.02017	0.0251	2.23E-08	0.000202	122.536
12	rs1154693	G	A	3	1.18E+08	0.856	0.032622	0.0302	3.12E-11	0.000262	159.3635
13	rs1160685	G	C	4	94052854	0.478	0.020772	0.0257	7.20E-09	0.000215	130.7949
14	rs11658881	G	A	17	2072949	0.418	0.020136	0.0255	2.43E-08	0.000197	119.824
15	rs11712680	C	A	3	75009019	0.174	-0.02705	0.0361	3.51E-09	0.00021	127.7331
16	rs117143374	C	T	21	40555561	0.12	0.02929	0.0409	2.76E-08	0.000181	110.052
17	rs11872397	A	G	18	72535282	0.252	-0.02477	0.0301	1.43E-09	0.000231	140.5296
18	rs12025237	C	A	1	1.54E+08	0.124	-0.033	0.0311	6.52E-10	0.000237	143.7013
19	rs12042107	C	T	1	91196176	0.527	-0.02228	0.0257	4.22E-10	0.000248	150.3722
20	rs12112638	G	A	7	69735251	0.275	-0.02453	0.0278	1.34E-09	0.00024	145.6981
21	rs12186738	T	G	5	1.04E+08	0.154	-0.03326	0.0353	3.42E-11	0.000288	175.1464
22	rs12333760	C	T	7	99185406	0.204	-0.02905	0.0296	1.44E-09	0.000274	166.449
23	rs12356821	C	G	10	1.05E+08	0.14	0.03937	0.0348	6.27E-15	0.000373	226.7487

24	rs12441907	A	C	15	83922387	0.186	-0.02921	0.0322	1.06E-10	0.000258	156.8889
25	rs12474587	T	G	2	1.63E+08	0.404	0.027633	0.0262	1.25E-14	0.000368	223.391
26	rs12545053	G	A	8	65073605	0.397	0.020281	0.0253	2.43E-08	0.000197	119.6159
27	rs12632110	G	A	3	50224225	0.647	-0.02338	0.0273	4.78E-10	0.00025	151.6292
28	rs13030994	A	G	2	1.46E+08	0.485	0.036093	0.0252	3.56E-24	0.000651	395.4495
29	rs13145728	C	G	4	1.41E+08	0.358	-0.02325	0.0259	2.14E-10	0.000249	150.9531
30	rs13261666	T	G	8	59814666	0.522	-0.02689	0.025	3.90E-14	0.000361	219.2859
31	rs134529	C	T	22	28781758	0.349	-0.01998	0.0265	4.85E-08	0.000181	110.2238
32	rs1385108	T	C	5	1.55E+08	0.239	0.024662	0.0276	3.00E-09	0.000221	134.3848
33	rs1435741	A	G	15	47935843	0.425	0.029415	0.0256	2.64E-16	0.000423	256.9251
34	rs1445649	C	T	2	1.56E+08	0.525	0.023993	0.0249	1.68E-11	0.000287	174.4132
35	rs1555445	T	A	20	31175258	0.337	0.022555	0.0252	3.65E-09	0.000227	138.0847
36	rs1565735	A	T	8	27426077	0.212	-0.03762	0.0354	3.42E-17	0.000473	287.266
37	rs1869243	C	T	3	5724536	0.481	0.019741	0.0249	2.97E-08	0.000195	118.1857
38	rs1899896	T	C	8	93201036	0.286	0.026448	0.0283	1.04E-11	0.000286	173.5412
39	rs1971318	T	C	12	1.21E+08	0.141	0.028507	0.039	7.06E-09	0.000197	119.5745
40	rs2046850	T	C	1	2.1E+08	0.187	-0.02481	0.0278	3.03E-08	0.000187	113.7179
41	rs2050586	C	G	1	87905828	0.355	-0.02055	0.0269	3.00E-08	0.000193	117.4307
42	rs2107300	G	C	2	2.01E+08	0.845	-0.0272	0.0352	3.27E-08	0.000194	117.7247
43	rs2140114	T	C	7	3407568	0.518	-0.02326	0.0255	4.70E-10	0.00027	164.0988
44	rs2186122	T	A	1	66470206	0.561	0.026057	0.0256	3.61E-13	0.000334	203.1687
45	rs222449	T	A	6	52916062	0.793	-0.02532	0.0299	1.08E-08	0.00021	127.8543
46	rs2378662	A	G	9	86707289	0.556	0.020948	0.0252	4.16E-09	0.000217	131.6045
47	rs240963	C	T	6	1.12E+08	0.836	-0.04104	0.0312	2.16E-17	0.000462	280.6623
48	rs2631024	G	A	8	91995577	0.737	-0.02296	0.0267	1.18E-08	0.000204	124.1799
49	rs266047	A	G	2	1.04E+08	0.529	-0.03051	0.0249	3.36E-16	0.000464	281.8267

50	rs3001723	A	G	1	44037685	0.321	0.033512	0.0282	8.12E-18	0.00049	297.4462
51	rs301805	G	T	1	8481016	0.559	0.021468	0.0262	2.80E-09	0.000227	138.0237
52	rs35702515	T	G	2	1.38E+08	0.162	0.025244	0.0335	2.43E-09	0.000173	105.0952
53	rs3800227	G	A	6	1.09E+08	0.701	0.022812	0.0266	1.93E-08	0.000218	132.5073
54	rs3801289	C	A	7	96638267	0.351	-0.02206	0.0252	3.74E-09	0.000222	134.6962
55	rs3904512	A	G	13	38357471	0.429	-0.02116	0.0255	3.23E-09	0.000219	133.2295
56	rs4044321	G	A	5	1.67E+08	0.642	-0.02784	0.0263	6.08E-14	0.000356	216.466
57	rs4236259	G	T	7	1708080	0.499	-0.02477	0.0251	3.35E-12	0.000307	186.3418
58	rs4352629	T	C	5	87756821	0.492	-0.02753	0.025	1.22E-14	0.000379	230.134
59	rs4523689	G	A	11	7950797	0.408	-0.02061	0.025	1.55E-08	0.000205	124.6277
60	rs4543592	C	T	9	3014254	0.468	0.021931	0.0255	7.46E-10	0.00024	145.4855
61	rs4674993	G	A	2	2.26E+08	0.207	-0.02521	0.0329	1.32E-08	0.000209	126.7597
62	rs4759228	C	G	12	56508409	0.27	-0.02169	0.0291	3.58E-08	0.000185	112.6584
63	rs4781977	C	T	16	17572674	0.205	-0.02387	0.0432	4.54E-08	0.000186	112.7757
64	rs4785836	C	T	16	65604652	0.398	-0.02047	0.0252	2.26E-08	0.000201	121.9677
65	rs578584	T	A	2	45143175	0.605	0.02868	0.0259	1.50E-15	0.000393	238.8416
66	rs6265	T	C	11	27679916	0.203	-0.03179	0.0344	3.77E-12	0.000327	198.6103
67	rs6433897	C	T	2	1.82E+08	0.754	0.022448	0.0285	3.16E-08	0.000187	113.5481
68	rs6508144	G	C	18	50026142	0.563	-0.02069	0.0251	7.97E-09	0.000211	127.9896
69	rs66680800	T	G	3	85985324	0.397	-0.02027	0.0254	2.83E-08	0.000197	119.5074
70	rs6669839	T	C	1	50625979	0.204	0.026004	0.0313	3.36E-09	0.00022	133.3975
71	rs6728726	C	T	2	623976	0.829	0.035449	0.0336	6.73E-14	0.000356	216.4357
72	rs6788098	T	A	3	85624131	0.623	-0.03135	0.0276	1.91E-17	0.000462	280.4286
73	rs6893752	G	A	5	60374912	0.766	-0.0241	0.0288	3.25E-09	0.000208	126.4668
74	rs7197072	T	C	16	717085	0.238	-0.02477	0.026	2.77E-09	0.000222	135.1474
75	rs7224742	T	C	17	30657058	0.595	-0.02071	0.0262	1.43E-08	0.000207	125.5577

76	rs72789632	T	C	5	1.07E+08	0.12	-0.03289	0.0458	5.02E-10	0.000228	138.7395
77	rs72896886	C	G	18	42632652	0.144	-0.02689	0.0338	2.75E-08	0.000178	108.261
78	rs7322872	T	C	13	1.01E+08	0.782	-0.02557	0.0329	3.58E-09	0.000223	135.4226
79	rs7555507	T	C	1	73766037	0.496	-0.02414	0.0249	1.14E-11	0.000291	177.0505
80	rs7585579	G	C	2	60024857	0.505	0.0224	0.025	1.88E-09	0.000251	152.3742
81	rs76214862	C	A	14	29500130	0.202	-0.02499	0.0294	3.99E-08	0.000201	122.2954
82	rs76608582	A	C	19	4474725	0.0389	-0.04956	0.0537	1.94E-09	0.000184	111.543
83	rs7921378	C	G	10	63674885	0.463	-0.02546	0.0249	8.26E-13	0.000322	195.8127
84	rs7929518	G	A	11	85980958	0.765	0.024238	0.0284	1.56E-08	0.000211	128.3008
85	rs7938812	G	T	11	1.13E+08	0.424	0.043791	0.0259	2.71E-33	0.000937	569.375
86	rs7969559	G	A	12	69655167	0.688	-0.02438	0.026	7.31E-10	0.000255	154.9494
87	rs9401770	A	G	6	98748008	0.273	0.027731	0.0264	3.47E-12	0.000305	185.4286
88	rs9423279	G	C	10	1.26E+08	0.641	-0.02051	0.0257	3.21E-08	0.000194	117.6329
89	rs9540729	T	A	13	66947124	0.501	-0.01955	0.0251	3.82E-08	0.000191	116.1015
90	rs962625	G	A	4	28473524	0.24	0.023718	0.0311	4.37E-09	0.000205	124.652
91	rs9835772	T	A	3	85766025	0.235	0.024047	0.0296	6.32E-09	0.000208	126.2915
92	rs993700	C	T	4	67825894	0.766	-0.02593	0.0295	1.53E-09	0.000241	146.3905

SNP, single nucleotide polymorphisms; A1, effect allele; A2, other allele; Chr, chromosome; EAF, effect allele frequency; SE, standard error

Table S4. Detailed information for instrumental variables of CigDay and association with gout.

Sort	SNP	A1	A2	Chr	Position	EAF	Beta	SE	Pval	R2	F
1	rs11725618	C	T	4	67053769	0.287	0.036064	0.028	4.67E-09	0.000532	179.6545
2	rs1579233	G	A	16	52074530	0.571	-0.03182	0.0264	1.07E-08	0.000496	167.417
3	rs2072659	G	C	1	1.55E+08	0.105	-0.06525	0.0422	1.71E-12	0.0008	270.1672
4	rs2084533	T	C	3	16872929	0.319	0.033641	0.0271	1.22E-08	0.000492	165.9458

5	rs215600	A	G	7	32333642	0.64	-0.04925	0.0279	1.10E-17	0.001118	377.4622
6	rs2273500	C	T	20	61986949	0.159	0.068094	0.0304	2.47E-18	0.00124	418.827
7	rs2424888	A	G	20	31047533	0.405	0.033485	0.025	2.76E-09	0.00054	182.3852
8	rs3025383	C	T	9	1.37E+08	0.18	-0.05784	0.0333	2.22E-16	0.000988	333.4652
9	rs34406232	A	C	19	41305530	0.0259	-0.14699	0.0788	1.33E-18	0.00109	368.173
10	rs4785587	A	G	16	89772619	0.511	-0.03362	0.0261	1.27E-09	0.000565	190.6855
11	rs56113850	C	T	19	41353107	0.568	0.107205	0.0249	1.10E-81	0.00564	1913.402
12	rs58379124	C	T	8	42579203	0.748	0.066939	0.029	9.00E-25	0.001689	570.8047
13	rs632811	G	A	15	59155050	0.351	-0.03671	0.0249	1.03E-08	0.000614	207.2824
14	rs73229090	A	C	8	27442127	0.113	0.05549	0.0425	2.44E-10	0.000617	208.3432
15	rs7431710	A	G	3	48935583	0.644	-0.03496	0.0264	1.82E-09	0.00056	189.1287
16	rs75494138	T	C	11	46465361	0.0618	0.059876	0.0626	1.45E-08	0.000416	140.3014
17	rs787362	A	T	4	67904931	0.452	0.030477	0.0249	4.50E-08	0.00046	155.2886
18	rs790564	C	A	8	64604218	0.719	-0.04089	0.0293	3.97E-11	0.000676	228.0909
19	rs7928017	A	C	11	1.13E+08	0.413	-0.03293	0.0278	3.14E-09	0.000526	177.4698
20	rs7951365	C	T	11	16377044	0.306	0.038951	0.0292	6.63E-11	0.000644	217.5143
21	rs8034191	C	T	15	78806023	0.328	0.182567	0.0263	1E-200	0.014693	5030.414
22	rs806798	C	T	6	26214473	0.543	-0.03085	0.0256	2.48E-08	0.000472	159.4185
23	rs895330	G	C	19	4060707	0.206	-0.039	0.0336	2.68E-08	0.000498	167.9624

SNP, single nucleotide polymorphisms; A1, effect allele; A2, other allele; Chr, chromosome; EAF, effect allele frequency; SE, standard error

Table S5. Detailed information for instrumental variables of DrnkWk and association with gout.

Sort	SNP	A1	A2	Chr	Position	EAF	Beta	SE	pval	R2	F
1	rs10085696	G	A	7	69783020	0.201	-0.01605	0.0305	1.24E-10	8.28E-05	27.91955
2	rs11860773	C	T	16	73912503	0.176	-0.01501	0.0315	8.35E-10	6.53E-05	22.03097

3	rs1229984	C	T	4	1E+08	0.953	0.188115	0.1762	1E-200	0.00317	1072.764
4	rs1260326	C	T	2	27730940	0.595	0.023812	0.0262	3.33E-33	0.000273	92.20829
5	rs13107325	T	C	4	1.03E+08	0.0654	-0.03645	0.1048	1.23E-20	0.000162	54.81142
6	rs13332432	G	C	16	85721809	0.296	0.014005	0.0289	5.94E-11	8.17E-05	27.57742
7	rs1387766	A	G	12	92081800	0.622	-0.01083	0.0266	4.79E-08	5.51E-05	18.59559
8	rs153106	C	T	16	28526897	0.409	-0.01361	0.0248	3.63E-12	8.96E-05	30.21818
9	rs16854020	A	G	4	42117559	0.127	0.018083	0.0445	4.82E-10	7.25E-05	24.46121
10	rs17542254	G	A	11	1.14E+08	0.251	0.013142	0.0299	8.96E-10	6.49E-05	21.9069
11	rs2049045	C	G	11	27694241	0.189	-0.01377	0.0347	3.97E-08	5.81E-05	19.60451
12	rs2299409	A	G	7	1.04E+08	0.493	-0.01055	0.0249	4.80E-08	5.57E-05	18.78669
13	rs28601761	G	C	8	1.27E+08	0.405	0.011299	0.0253	7.60E-09	6.15E-05	20.75671
14	rs28680958	A	G	1	1.74E+08	0.23	-0.01358	0.0313	9.78E-09	6.54E-05	22.05164
15	rs28712821	A	G	4	39413780	0.594	0.028334	0.0262	1.10E-46	0.000387	130.6715
16	rs28732378	G	A	3	85403892	0.729	-0.01673	0.029	2.24E-14	0.000111	37.29832
17	rs28929474	T	C	14	94844947	0.0154	-0.04768	0.092	2.39E-11	6.89E-05	23.25878
18	rs331939	A	G	4	1.44E+08	0.339	-0.0119	0.0274	4.50E-09	6.35E-05	21.41544
19	rs34121753	G	A	17	7733833	0.532	0.011069	0.0252	1.39E-08	6.10E-05	20.58352
20	rs4309187	C	A	11	1.13E+08	0.697	0.014791	0.0329	1.37E-12	9.24E-05	31.17356
21	rs4752999	T	C	11	47428565	0.321	-0.01456	0.0287	2.03E-12	9.25E-05	31.19477
22	rs494904	C	T	2	45141180	0.429	0.015085	0.025	1.41E-14	0.000111	37.61044
23	rs55872084	T	G	5	1.56E+08	0.218	0.012731	0.0339	1.98E-08	5.53E-05	18.64349
24	rs55932213	G	A	9	1.09E+08	0.701	0.012477	0.0283	1.80E-08	6.53E-05	22.01428
25	rs6106989	A	G	20	25027630	0.628	0.010899	0.0265	3.81E-08	5.55E-05	18.7249
26	rs6739804	C	T	2	63269604	0.66	-0.01297	0.0262	4.72E-10	7.55E-05	25.46495
27	rs676388	C	T	19	49211969	0.494	0.015098	0.0253	5.49E-15	0.000114	38.44416
28	rs6969458	A	G	7	1.53E+08	0.459	0.012706	0.0255	5.20E-11	8.02E-05	27.0502

29	rs75120545	T	C	2	44271496	0.022	-0.03279	0.06	7.59E-09	4.63E-05	15.60455
30	rs76640332	A	G	17	44189858	0.204	-0.02101	0.0462	1.47E-18	0.000143	48.3578
31	rs78234152	A	G	4	1E+08	0.0986	0.027654	0.036	2.18E-19	0.000136	45.86176
32	rs79616692	C	G	16	72338507	0.11	0.018809	0.0379	2.38E-09	6.93E-05	23.36731
33	rs962961	T	C	14	57281154	0.329	-0.01219	0.0262	2.78E-09	6.56E-05	22.12763
34	rs9835772	T	A	3	85766025	0.235	0.013204	0.0296	3.90E-09	6.27E-05	21.14795

SNP, single nucleotide polymorphisms; A1, effect allele; A2, other allele; Chr, chromosome; EAF, effect allele frequency; SE, standard error

Table S6. Detailed information for instrumental variables of Teacon and association with gout.

Sort	SNP	A1	A2	Chr	Position	EAF	Beta	SE	Pval	R2	F
1	rs10741694	C	T	11	16286183	0.7331	-0.0117	0.0281	2.78E-09	5.36E-05	23.25675
2	rs10752269	A	G	10	12692902	0.6466	-0.023	0.0261	4.33E-08	0.000242	104.9402
3	rs1093707	G	T	9	7006539	0.2359	-0.0434	0.0293	3.59E-09	0.000679	294.6127
4	rs11007604	T	C	10	29758515	0.1529	-0.0296	0.0346	1.13E-08	0.000227	98.51805
5	rs11704820	G	A	22	24912248	0.4726	0.0321	0.025	6.03E-15	0.000514	222.8997
6	rs12446615	G	A	16	73915896	0.6112	0.042	0.0256	1.46E-08	0.000838	363.6912
7	rs13034607	T	C	2	50353839	0.5823	-0.04	0.0253	6.69E-09	0.000778	337.6618
8	rs1542329	A	G	11	59214479	0.6706	0.065	0.0264	2.85E-10	0.001867	808.8934
9	rs2117137	G	A	3	89587262	0.4986	-0.0363	0.0248	4.07E-12	0.000659	285.8594
10	rs2285859	G	A	19	19422485	0.2468	0.054	0.0289	2.09E-08	0.001084	470.1763
11	rs2350826	G	T	10	87012225	0.2179	-0.0275	0.0301	8.37E-09	0.000258	111.8824
12	rs2465018	A	G	6	51241140	0.1829	-0.0158	0.0322	1.17E-15	7.46E-05	32.39362
13	rs2472297	T	C	15	75027880	0.2478	-0.0855	0.0289	1.65E-36	0.002725	1179.969
14	rs2869657	G	A	20	51190821	0.7276	0.0089	0.0279	5.07E-09	3.14E-05	13.63186

15	rs325502	A	G	5	1.04E+08	0.6128	-0.0369	0.0256	1.55E-08	0.000646	280.3593
16	rs4357628	C	A	10	87391290	0.2734	0.0204	0.0279	1.01E-08	0.000165	71.77467
17	rs4410790	C	T	7	17284577	0.6647	-0.0568	0.0264	6.18E-20	0.001438	623.476
18	rs4726481	T	G	7	1.42E+08	0.3448	0.038	0.0263	7.19E-09	0.000652	283.0829
19	rs4817505	C	T	21	34343828	0.4328	-0.0265	0.0253	5.92E-12	0.000345	149.6423
20	rs4926833	A	G	1	50311454	0.5706	-0.0186	0.0252	2.29E-08	0.00017	73.59272
21	rs56163935	C	T	7	75788744	0.3107	-0.0115	0.0269	8.02E-09	5.66E-05	24.59288
22	rs56188862	C	T	1	1.74E+08	0.3654	0.0147	0.0258	2.77E-08	0.0001	43.50594
23	rs57462170	A	G	3	50239803	0.1417	0.0694	0.0358	2.08E-11	0.001172	508.0514
24	rs57631352	G	A	19	4338173	0.3357	-0.058	0.0264	1.74E-09	0.0015	650.4416
25	rs72797284	G	A	5	1.52E+08	0.2089	0.0751	0.0306	3.84E-11	0.001864	807.8452
26	rs977474	T	C	12	11284772	0.9159	-0.0375	0.0447	4.21E-16	0.000217	94.03755

SNP, single nucleotide polymorphisms; A1, effect allele; A2, other allele; Chr, chromosome; EAF, effect allele frequency; SE, standard error

Table S7. Detailed information for instrumental variables of Concon and association with gout.

Sort	SNP	A1	A2	Chr	Position	EAF	Beta	SE	Pval	R2	F
1	rs2065113	G	A	9	7938226	0.18808	-0.02582	0.0438	1.40E-09	0.000204	13.23042
2	rs2472297	T	C	15	75027880	0.25771	-0.0855	0.0289	7.30E-10	0.002797	182.1556
3	rs6968865	T	A	7	17287269	0.626977	-0.0506	0.0263	2.90E-13	0.001198	77.87495

SNP, single nucleotide polymorphisms; A1, effect allele; A2, other allele; Chr, chromosome; EAF, effect allele frequency; SE, standard error

Table S8. Five methods were used to evaluate the causal relationship between exposure and outcome in Univariate Mendelian randomization analysis.

exposure	method	nsnp	pval	or	or_lci95	or_uci95
AgeSmk	Mg Egger	7	0.847	0.71	0.03	19.64
	weighted median	7	0.64	0.74	0.21	2.59
	Inverse variance weighted	7	0.591	0.75	0.26	2.16
	Simple mode	7	0.874	0.86	0.14	5.24
	Weighted mode	7	0.767	0.76	0.13	4.31
SmkInt	Mg Egger	85	0.882	0.92	0.29	2.93
	weighted median	85	0.459	0.88	0.63	1.23
	Inverse variance weighted	85	0.755	0.96	0.77	1.21
	Simple mode	85	0.708	0.86	0.40	1.86
	Weighted mode	85	0.601	0.81	0.36	1.80
CigDay	Mg Egger	22	0.604	0.91	0.63	1.30
	weighted median	22	0.906	0.99	0.77	1.26
	Inverse variance weighted	22	0.927	1.01	0.82	1.24
	Simple mode	22	0.134	1.56	0.89	2.75
	Weighted mode	22	0.966	1.01	0.78	1.30
DrnkWk	Mg Egger	34	0.045	0.11	0.01	0.87
	weighted median	34	0.242	1.81	0.67	4.91
	Inverse variance weighted	34	0.552	0.75	0.29	1.93
	Simple mode	34	0.301	3.06	0.38	24.6

Teacon	Weighted mode	34	0.190	2.96	0.60	14.6
	Mg Egger	26	0.101	0.01	6.21E-05	1.97
	weighted median	26	0.002	0.06	0.01	0.35
	Inverse variance weighted	26	0.003	0.13	0.04	0.51
	Simple mode	26	0.209	0.11	3.49E-03	3.22
Cofcon	Weighted mode	26	0.014	0.02	1.55E-03	0.39
	Mg Egger	3	0.424	4.23E+03	0.02	1.01E+09
	weighted median	3	0.034	7.69E-03	0.01	0.08
	Inverse variance weighted	3	0.024	0.07	0.01	0.71
	Simple mode	3	0.223	0.06	2.41E-02	1.42
	Weighted mode	3	0.228	0.07	3.68E-02	1.44

Table S9. Heterogeneity test of causal relationship between smoking, drinking alcohol, drinking tea, drinking coffee, and gout.

Outcome	Heterogeneity					
	MR-Egger			IVW		
	Cochrane Q	Q_df	P-value	Cochrane Q	Q_df	P-value
AgeSmk	0.8566771	5	0.9732783	0.8577600	6	0.9904348
SmkInit	83.60030	83	0.4608778	83.60822	84	0.4915392
CigDay	25.01102	20	0.2010099	25.63093	21	0.2208725
DrnkWk	71.20285	32	8.287534E-05	80.27189	33	8.146301E-06
Teacon	29.50645	24	0.2016515	30.68229	25	0.1997556

Cofcon	0.4321826	1	0.5109199	3.5457994	2	0.1698398
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Table S10. A pleiotropic test on the causal relationship between smoking, drinking alcohol, drinking tea, and drinking coffee and gout.

outcome	MR-Egger			MR-Presso
	Intercept	se	P-value	P-value
AgeSmk	0.001179421	0.03584122	0.9750221	0.989
SmkInit	0.001367854	0.01542921	0.9295708	0.497
CigDay	0.008672287	0.01231742	0.4895083	0.299
DrnkWk	0.03638094	0.01802051	0.05194622	0.122
Teacon	0.02307839	0.02359853	0.3378504	0.199
Cofcon	-0.2208129	0.1251388	0.382337	NA

Table S11. Two methods were used to evaluate the causal relationship between exposure and outcome in Multivariate Mendelian randomization analysis.

exposure	adjustment	method	nsnp	or	or_lci95	or_uci95	pval
AgeSmk	DrnkWk, Teacon, Cofcon	Inverse variance weighted	5	0.3292724	0.04880801	2.2213633	0.25405608
		Mr Egger		0.330219	0.028107	3.879553	0.378
SmkInt	DrnkWk, Teacon, Cofcon	Inverse variance weighted	74	1.1679883	0.77406689	1.762376	0.459398341
		Mr Egger		1.228753	0.563223	2.680705	0.604
CigDay	DrnkWk, Teacon, Cofcon	Inverse variance weighted	15	0.9619417	0.6661387	1.389098	0.83603636
		Mr Egger		0.900325	0.581537	1.393864	0.637
DrnkWk	AgeSmk, Teacon, Cofcon	Inverse variance weighted	30	0.4385367	0.12860832	1.4953500	0.18780477
		Mr Egger		0.438673	0.127108	1.513947	0.192
DrnkWk	SmkInt, Teacon, Cofcon	Inverse variance weighted	24	0.3645575	0.12881019	1.031767	0.057291356

		Mr Egger		0.380602	0.131814	1.098955	0.074
DrnkWk	CigDay, Teacon, Cofcon	Inverse variance weighted	30	0.4849196	0.1499697	1.567964	0.22673776
		Mr Egger		0.468603	0.143159	1.533879	0.210
Teacon	AgeSmk, DrnkWk, Cofcon	Inverse variance weighted	34	0.2806320	0.10330138	0.7623742	0.01269882
		Mr Egger		0.280551	0.102444	0.768312	0.013
Teacon	SmkInt, DrnkWk, Cofcon	Inverse variance weighted	31	0.2839032	0.12750466	0.632142	0.002049277
		Mr Egger		0.270631	0.119749	0.611623	0.002
Teacon	CigDay, DrnkWk, Cofcon	Inverse variance weighted	31	0.2999112	0.1043707	0.861801	0.02534035
		Mr Egger		0.294346	0.101741	0.851565	0.024
CofCon	AgeSmk, DrnkWk, Teacon	Inverse variance weighted	3	0.3671228	0.03029437	4.4489831	0.43112243
		Mr Egger		0.367144	0.029698	4.538879	0.435
CofCon	SmkInt, DrnkWk, Teacon	Inverse variance weighted	2	0.6157001	0.09622882	3.939429	0.608536766
		Mr Egger		0.666977	0.099055	4.491021	0.863
CofCon	CigDay, DrnkWk, Teacon	Inverse variance weighted	2	0.3441072	0.0329182	3.597091	0.37297043
		Mr Egger		0.319499	0.029761	3.429999	0.579

Figure S1. Leave one out of SNP associated with exposure and risk of gout.

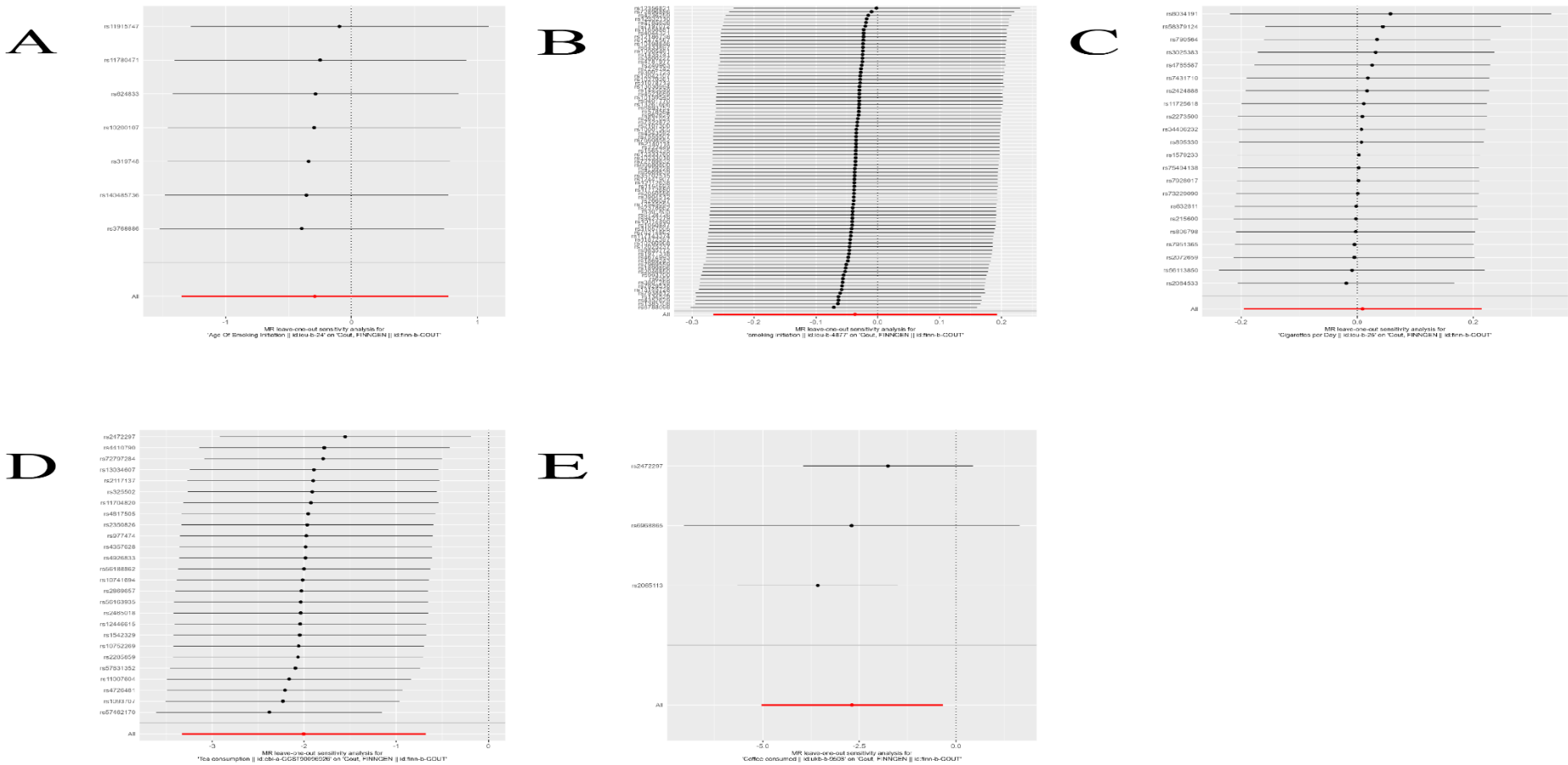


Figure S2. Funnel plots to show symmetrical distribution of individual variant estimates around the point estimate.

