

Table S1 Information for SNP data

Name	Dataset	Population	Sample size	Number of SNPs
AF	HUNT, MGI, deCODE, DiscovEHR, UK Biobank, AFGen	European	1,030,836	33,519,037
EC	UK Biobank and FinnGen	European	476,306	24,194,380
Smoking	UK Biobank	European	461,066	9,851,867
Alcohol	UK Biobank	European	360,726	13,586,591
Obesity	UK Biobank	European	463,010	9,851,867
Education	UK Biobank	European	470,941	11,972,619

SNP, single-nucleotide polymorphism; AF, atrial fibrillation; EC, esophageal cancer.

Table S2 SNPs of AF extracted from UK Biobank with statistically significant threshold

SNP	EA	NEA	EAF	Beta	SE	Pval
rs11264280	T	C	0.333	0.1347	0.0071	3.07E-79
rs4073778	A	C	0.5639	0.0486	0.0067	4.96E-13
rs284277	A	C	0.6174	-0.0422	0.0069	1.25E-09
rs577676	T	C	0.4383	-0.0923	0.0067	1.62E-43
rs72694603	T	C	0.3147	-0.0553	0.0072	2.26E-14
rs79187193	A	G	0.0569	-0.1162	0.0153	3.15E-14
rs6665642	T	C	0.1176	-0.062	0.0112	3.06E-08
rs72700114	C	G	0.0756	0.2021	0.013	3.29E-54
rs10753933	G	T	0.5518	-0.0609	0.0067	9.84E-20
rs6689306	G	A	0.5872	-0.046	0.0068	1.36E-11
rs146518726	A	G	0.0328	0.1605	0.0207	8.27E-15
rs74832855	G	A	0.0369	0.1216	0.018	1.43E-11
rs7529220	C	T	0.8469	0.0621	0.0098	1.98E-10
rs2885697	T	G	0.6482	-0.0439	0.007	2.88E-10
rs6546620	C	T	0.7999	0.0602	0.0086	3.19E-12
rs28387148	T	C	0.1051	0.0741	0.0113	6.25E-11
rs6747542	C	T	0.4642	-0.0554	0.0067	1.10E-16
rs7574892	A	G	0.4847	0.0552	0.0067	1.98E-16
rs67969609	G	C	0.071	0.0711	0.0126	1.71E-08
rs35544454	T	A	0.1918	-0.0589	0.0087	1.10E-11
rs72926475	A	G	0.1228	-0.0683	0.0102	2.37E-11
rs2288327	G	A	0.1564	0.0919	0.0089	7.26E-25
rs56326533	C	T	0.3919	0.0685	0.0068	6.28E-24
rs2540949	T	A	0.3847	-0.0659	0.0068	2.95E-22
rs4642101	G	T	0.6397	0.0706	0.0069	2.95E-24
rs6771054	C	T	0.4035	-0.0457	0.0068	2.42E-11
rs7612445	T	G	0.1879	0.0493	0.0084	4.81E-09
rs62254082	C	T	0.3865	0.0404	0.007	6.34E-09
rs1278493	A	G	0.5645	-0.0389	0.0068	8.77E-09
rs34080181	A	G	0.379	-0.0446	0.0069	1.28E-10
rs73041705	C	T	0.2985	-0.0443	0.0073	1.55E-09
rs60902112	T	C	0.2262	0.0445	0.0079	1.72E-08
rs6790396	G	C	0.5959	0.0627	0.0068	2.40E-20
rs10804493	A	G	0.6505	0.0558	0.007	1.63E-15
rs6838973	T	C	0.4406	-0.1514	0.0067	1.03E-111
rs74500426	T	G	0.0764	-0.0921	0.0127	4.29E-13
rs1906615	T	G	0.1991	0.3658	0.0081	1.00E-200
rs1458038	T	C	0.3087	0.0434	0.0072	1.74E-09
rs10213171	G	C	0.0609	0.091	0.0134	1.32E-11
rs10520260	G	A	0.3214	-0.0457	0.0073	3.36E-10
rs17171711	T	C	0.1775	0.1086	0.0087	1.95E-35
rs6580277	G	A	0.2369	0.067	0.0079	1.64E-17
rs337705	G	T	0.3749	0.0564	0.0068	1.63E-16
rs1838747	G	A	0.4954	0.0391	0.0067	4.13E-09
rs62377206	A	G	0.0554	0.0846	0.0147	8.21E-09
rs6882776	A	G	0.2835	-0.0711	0.0074	9.64E-22
rs6596717	A	C	0.6049	-0.0404	0.0068	3.00E-09
rs10520002	A	G	0.0988	0.0626	0.0113	2.85E-08
rs72966339	T	C	0.3679	-0.0616	0.0069	7.42E-19
rs2031522	G	A	0.3764	-0.0436	0.0068	1.47E-10
rs34969716	A	G	0.3051	0.0702	0.0078	1.60E-19
rs3176326	A	G	0.1982	-0.0626	0.0085	1.42E-13
rs73366713	A	G	0.1396	-0.1035	0.0099	1.53E-25
rs4946333	G	A	0.4897	0.0639	0.0066	5.47E-22
rs117984853	T	G	0.1013	0.1228	0.012	1.34E-24
rs55734480	A	G	0.2494	0.0548	0.0078	2.20E-12
rs55985730	G	T	0.06	0.0867	0.0149	5.24E-09
rs74910854	G	A	0.0693	0.09	0.0164	4.31E-08
rs56201652	A	G	0.267	-0.0531	0.0075	1.74E-12
rs7789146	A	G	0.1787	-0.0584	0.0087	2.12E-11
rs6462079	A	G	0.7208	0.0466	0.0076	8.79E-10
rs11773845	A	C	0.5856	0.1054	0.0067	2.39E-55
rs62521286	G	A	0.0663	0.1202	0.0135	4.50E-19
rs6994744	C	A	0.4954	0.0405	0.0066	1.09E-09
rs35963991	T	G	0.1494	0.0525	0.0095	2.80E-08
rs7508	A	G	0.7109	0.0711	0.0075	1.69E-21
rs10821415	A	C	0.4132	0.0821	0.0067	2.92E-34
rs2274115	G	A	0.7003	0.0487	0.0076	1.69E-10
rs11191116	T	C	0.348	-0.041	0.007	4.42E-09
rs7915134	T	C	0.1439	-0.1168	0.0095	1.42E-34
rs12245149	A	C	0.4739	-0.047	0.0067	1.66E-12
rs10458662	G	T	0.1722	0.0544	0.0088	6.93E-10
rs11598047	G	A	0.1621	0.1537	0.009	8.95E-66
rs34936990	A	G	0.1207	0.1294	0.0101	2.95E-37
rs4757877	G	A	0.7552	-0.0723	0.0078	2.93E-20
rs4935786	A	T	0.7327	-0.0463	0.0079	4.85E-09
rs76097649	A	G	0.0933	0.1151	0.0124	1.26E-20
rs10842383	T	C	0.1478	-0.0988	0.0095	2.88E-25
rs71454237	A	G	0.209	-0.062	0.0084	1.78E-13
rs12426679	T	C	0.5278	-0.0391	0.0067	4.95E-09
rs6560886	C	T	0.7884	0.051	0.009	1.49E-08
rs883079	T	C	0.7074	0.0981	0.0074	2.84E-40
rs17380837	T	C	0.307	-0.0501	0.0072	4.80E-12
rs2860482	C	A	0.726	-0.054	0.0076	1.21E-12
rs775498	G	A	0.2798	0.0423	0.0074	1.05E-08
rs10773657	A	C	0.862	-0.0575	0.0103	2.54E-08
rs35569628	C	T	0.223	-0.0452	0.008	1.38E-08
rs9506925	T	C	0.2669	0.0449	0.0075	2.72E-09
rs74884082	T	C	0.2495	-0.0493	0.0078	3.48E-10
rs4587869	C	G	0.2849	0.0716	0.0077	1.19E-20
rs2738413	G	A	0.5049	-0.0778	0.0067	2.55E-31
rs10141892	C	T	0.5833	-0.0452	0.0068	2.95E-11
rs28631169	T	C	0.1982	0.0522	0.0084	5.35E-10
rs7172038	G	T	0.1597	0.112	0.0089	4.78E-36
rs2759301	A	G	0.4542	0.039	0.0067	5.04E-09
rs4965430	G	C	0.6136	-0.0441	0.0069	1.26E-10
rs2359171	A	T	0.176	0.1746	0.0086	4.65E-91
rs77316573	T	C	0.1991	0.0529	0.0089	3.26E-09
rs140185678	A	G	0.0351	0.1659	0.0218	2.43E-14
rs1563304	T	C	0.178	0.0644	0.0092	2.56E-12
rs72811294	C	G	0.1131	-0.072	0.0106	9.67E-12
rs7225165	A	G	0.1133	-0.0655	0.0111	3.20E-09
rs7224711	T	C	0.5222	-0.0365	0.0066	3.72E-08
rs9953366	C	T	0.6631	0.049	0.0073	1.82E-11
rs8088085	C	A	0.4646	-0.0365	0.0067	4.79E-08
rs2834618	G	T	0.1056	-0.0944	0.0112	3.41E-17
rs464901	C	T	0.3353	-0.0508	0.0072	1.53E-12
rs133885	A	G	0.4377	0.0405	0.0068	2.22E-09

SNP, single-nucleotide polymorphism; AF, atrial fibrillation; EA, effect allele; NEA, non-effect allele; EAF, effect allele frequency; Beta, beta coefficient; SE, standard error of beta coefficient; Pval, P value of the meta-analysis.

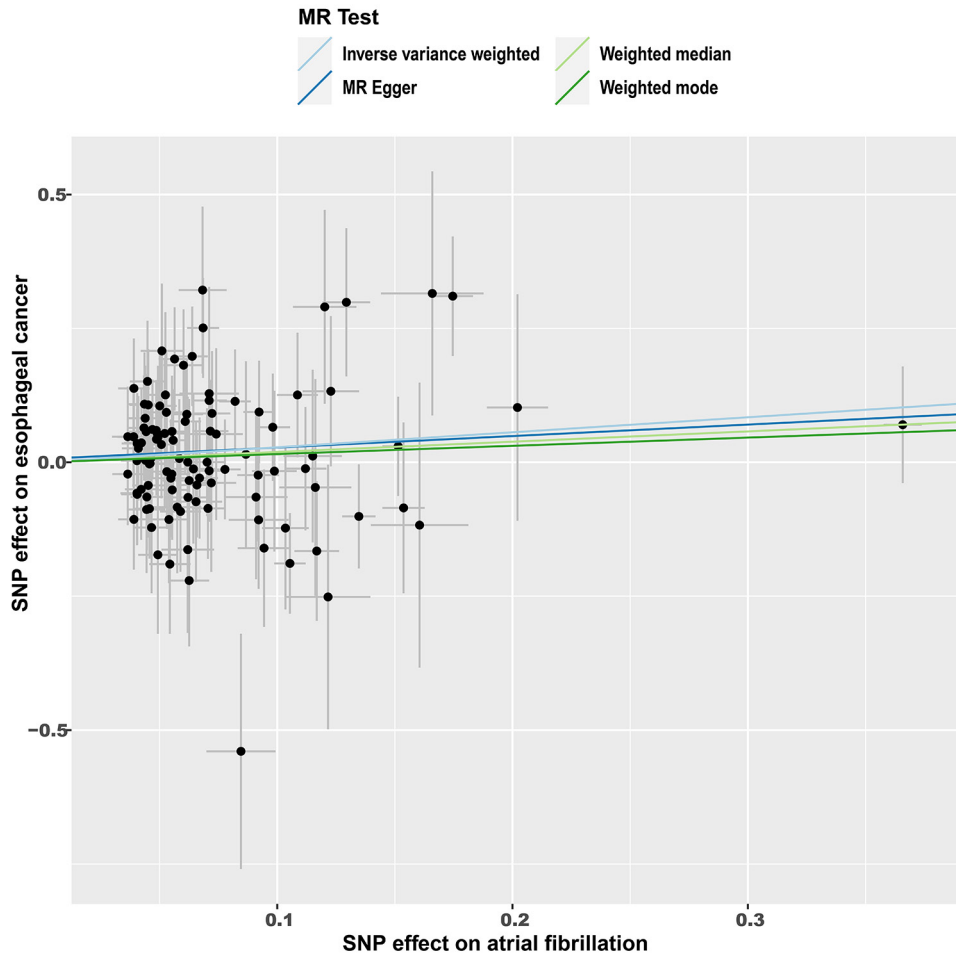


Figure S1 Scatter plots of the association of between AF and EC. MR, Mendelian randomization; AF, atrial fibrillation; SNP, single-nucleotide polymorphism; EC, esophageal cancer.

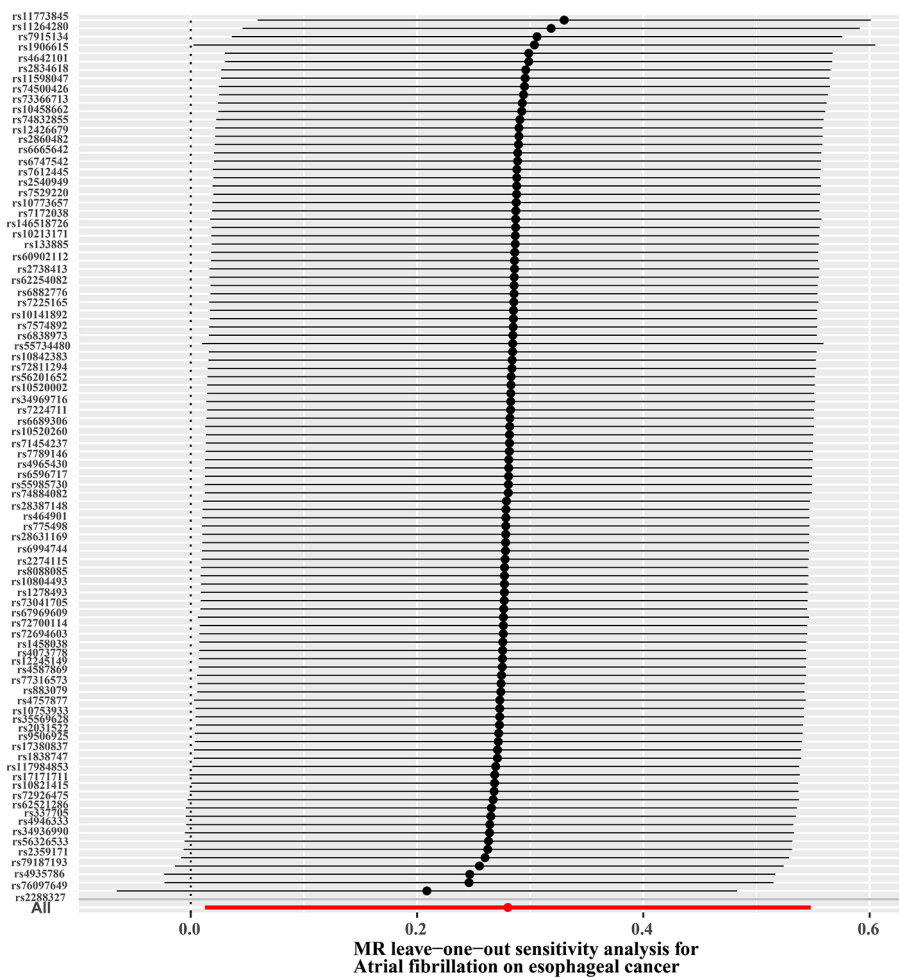


Figure S2 The leave-one-out sensitivity analysis of AF with EC. MR, Mendelian randomization; AF, atrial fibrillation; EC, esophageal cancer.

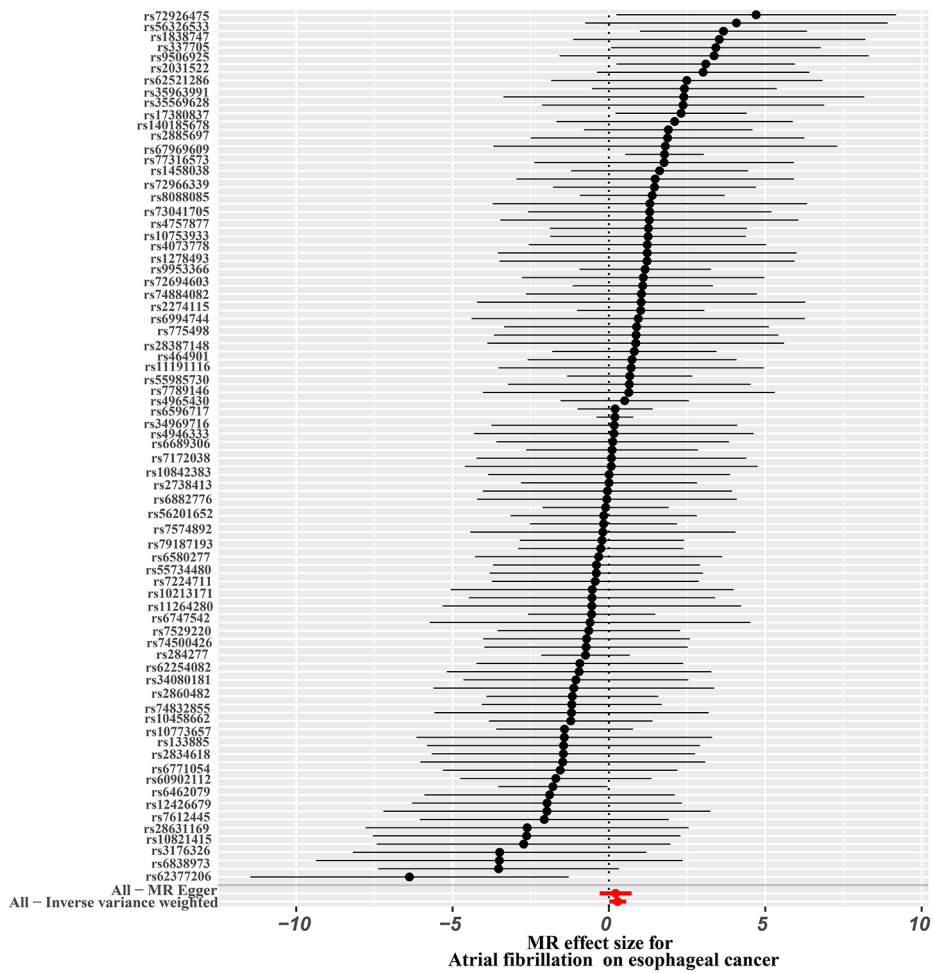


Figure S3 Associations of each variant of AF on EC. MR, Mendelian randomization; AF, atrial fibrillation; EC, esophageal cancer.