

Table S1 SNPs of sleep traits extracted from Neale Lab with statistically significant threshold ($P < 5 \times 10^{-8}$; LD $r^2 < 0.001$; LD distance $> 10,000$ kb)

Exposure	Chr.	SNP	Effect allele	Other allele	Sample size	Beta	SE	P value exposure	F statistic
Sleep duration	2	rs10496079	C	G	335,410	0.0149485	0.001943	1.43549E-14	59.19017587
Sleep duration	10	rs10510128	A	G	335,410	0.0142444	0.00232619	9.16621E-10	37.49712345
Sleep duration	9	rs10973207	T	G	335,410	0.0143714	0.00258966	2.86655E-08	30.79730097
Sleep duration	3	rs113021516	C	G	335,410	-0.0110596	0.00199129	2.7946E-08	30.84677844
Sleep duration	14	rs11621908	T	C	335,410	-0.0190912	0.00345332	3.23452E-08	30.5627766
Sleep duration	16	rs11643715	G	C	335,410	0.0114788	0.00207164	3.01058E-08	30.70183987
Sleep duration	17	rs11650677	A	G	335,410	0.0115464	0.00198352	5.84884E-09	33.88597839
Sleep duration	7	rs11982852	T	C	335,410	-0.0132168	0.00218382	1.43094E-09	36.62848519
Sleep duration	4	rs12501164	C	T	335,410	0.0105567	0.00188259	2.05409E-08	31.44451243
Sleep duration	1	rs12567114	A	C	335,410	0.0125472	0.00210937	2.71132E-09	35.38246708
Sleep duration	4	rs13107325	T	G	335,410	-0.0218603	0.0035717	9.34351E-10	37.45952688
Sleep duration	9	rs1570203	A	G	335,410	-0.0120604	0.00189358	1.9041E-10	40.56543227
Sleep duration	16	rs17822558	A	G	335,410	-0.0112192	0.00203133	2.5053E-09	31.05847578
Sleep duration	5	rs1807669	C	T	335,410	-0.0109965	0.00190259	7.48807E-08	33.40554516
Sleep duration	8	rs28375285	T	A	335,410	-0.010793	0.00196795	1.45241E-08	30.07850413
Sleep duration	19	rs34786000	T	G	335,410	0.0119386	0.00190766	3.89745E-10	39.16566049
Sleep duration	11	rs35186585	C	A	335,410	-0.0127368	0.00225195	1.55178E-08	31.98918469
Sleep duration	5	rs37021	G	A	335,410	-0.0105302	0.00189728	2.85621E-08	30.80423177
Sleep duration	2	rs374153	T	C	335,410	-0.0147595	0.00257034	9.3519E-09	32.97327928
Sleep duration	16	rs3751813	T	G	335,410	-0.0115392	0.00188372	9.03545E-10	37.52482744
Sleep duration	8	rs448231	A	T	335,410	0.0114354	0.00189582	1.62218E-09	36.38383888
Sleep duration	1	rs4588900	A	G	335,410	-0.0104127	0.00187585	2.84394E-08	30.81275261
Sleep duration	1	rs4642942	G	C	335,410	-0.0120502	0.00190754	2.6786E-10	39.90627609
Sleep duration	2	rs4667876	G	C	335,410	0.0112695	0.0018979	2.88988E-09	35.25840355
Sleep duration	7	rs4730640	C	T	335,410	-0.0130652	0.00194119	1.69317E-11	45.29977383
Sleep duration	12	rs4767550	G	A	335,410	0.0105358	0.00191423	3.71741E-08	30.29331489
Sleep duration	6	rs4897409	A	G	335,410	-0.0111426	0.00203703	4.50308E-08	29.92114651
Sleep duration	2	rs56337305	C	T	335,410	0.0108241	0.00194397	2.57858E-08	31.00305387
Sleep duration	11	rs61916239	G	T	335,410	0.0108416	0.0019785	4.26373E-09	30.02718715
Sleep duration	2	rs62158206	C	T	335,410	0.0299287	0.00227247	1.33333E-39	173.4520307
Sleep duration	7	rs62444917	C	A	335,410	0.012786	0.00227012	1.77959E-08	31.72281879
Sleep duration	1	rs6681755	A	G	335,410	0.0141022	0.00235751	2.20882E-11	35.78216814
Sleep duration	5	rs689892	A	G	335,410	0.0109914	0.00198002	3.22619E-08	30.56782425
Sleep duration	8	rs7016314	C	T	335,410	0.0112913	0.00198197	1.22042E-08	32.45590621
Sleep duration	11	rs7115462	A	G	335,410	0.0211471	0.00361334	4.84674E-11	34.25184582
Sleep duration	2	rs74889896	G	A	335,410	0.0224984	0.00337498	2.62845E-11	44.3865036
Sleep duration	6	rs7764984	G	A	335,410	-0.0129647	0.00198986	8.84301E-11	42.06459733
Sleep duration	2	rs80071665	T	G	335,410	-0.0163667	0.00290418	1.74606E-08	31.75961165
Sleep duration	16	rs802310	G	A	335,410	0.0149247	0.00231689	1.18326E-10	41.49544154
Sleep duration	15	rs8029928	T	C	335,410	-0.013917	0.00202125	2.57976E-10	39.97169055
Sleep duration	1	rs915416	G	C	335,410	-0.0115323	0.00207	2.53233E-08	31.03781729
Sleep duration	11	rs925872	T	C	335,410	-0.0114386	0.00189086	1.45546E-09	36.59544202
Sleep duration	3	rs9810474	G	C	335,410	-0.0127716	0.00221974	8.74118E-09	33.10445177
Sleep duration	17	rs9895274	T	C	335,410	-0.0103308	0.00187947	3.8732E-08	30.21322688
Getting up in morning	14	rs1014895	T	G	336,501	0.0109657	0.00191665	1.05801E-08	32.73309671
Getting up in morning	2	rs10175975	T	G	336,501	0.0133319	0.00244312	4.99517E-08	29.72033086
Getting up in morning	2	rs1039887	G	A	336,501	-0.0197531	0.0026142	4.1639E-14	57.0943199
Getting up in morning	1	rs10462020	G	T	336,501	0.01468	0.00234272	7.30391E-08	39.26551887
Getting up in morning	1	rs10518446	C	T	336,501	0.021058	0.00252185	6.83912E-17	69.72615787
Getting up in morning	9	rs10760663	A	G	336,501	0.0109466	0.00187654	5.43638E-09	34.02805311
Getting up in morning	12	rs11181153	T	C	336,501	-0.0104706	0.00189668	3.32277E-08	30.51072981
Getting up in morning	9	rs117965994	T	C	336,501	-0.0283302	0.00458183	3.3401E-08	30.50052256
Getting up in morning	12	rs12227309	T	C	336,501	0.0122073	0.00216894	3.34072E-09	34.97642582
Getting up in morning	1	rs12736689	C	T	336,501	0.0524841	0.00545571	6.62396E-22	92.54498871
Getting up in morning	1	rs12752299	C	T	336,501	0.0119338	0.00189039	3.19455E-09	35.76325871
Getting up in morning	18	rs12969848	T	C	336,501	0.0105615	0.00187436	1.75509E-08	31.05010688
Getting up in morning	22	rs13058062	C	T	336,501	-0.0113288	0.00206073	3.85505E-08	30.22216918
Getting up in morning	2	rs1402112	C	T	336,501	0.0137899	0.0023337	3.44477E-09	34.91661877
Getting up in morning	16	rs1421085	C	T	336,501	0.0105507	0.00190226	2.9179E-08	30.76258291
Getting up in morning	2	rs1542344	G	A	336,501	0.0122971	0.00198035	5.31863E-10	38.55862194
Getting up in morning	8	rs1564470	A	C	336,501	0.0110272	0.00198632	2.83354E-08	30.81996008
Getting up in morning	12	rs17464772	A	G	336,501	0.0135003	0.00195402	4.88877E-12	47.73411001
Getting up in morning	7	rs1914397	A	T	336,501	0.0105812	0.00187969	1.81155E-08	31.68818644
Getting up in morning	8	rs2360802	T	A	336,501	0.0127358	0.00223494	1.20968E-08	32.47287374
Getting up in morning	17	rs2523217	C	T	336,501	0.0150735	0.00250885	1.87867E-09	36.0976407
Getting up in morning	6	rs2653356	G	A	336,501	-0.0244375	0.00243331	9.95176E-24	100.8599312
Getting up in morning	3	rs2859580	A	G	336,501	0.0171345	0.00294161	5.72058E-09	33.92912699
Getting up in morning	16	rs2908897	T	G	336,501	-0.0125754	0.00204659	8.0262E-10	37.75564761
Getting up in morning	17	rs34626694	T	C	336,501	-0.0112884	0.00198473	1.28911E-08	32.34907833
Getting up in morning	6	rs4716098	G	A	336,501	-0.0194848	0.00355191	4.1205E-08	30.09317419
Getting up in morning	17	rs4790352	A	G	336,501	0.0198655	0.00340366	5.33519E-09	34.06486398
Getting up in morning	5	rs4958318	T	C	336,501	0.0145983	0.00205853	1.25824E-12	49.33784041
Getting up in morning	10	rs4962716	C	T	336,501	0.0155354	0.00280549	3.07065E-08	30.6639028
Getting up in morning	12	rs4964519	G	C	336,501	0.0108713	0.0019305	1.78982E-08	31.71197929
Getting up in morning	14	rs57140837	C	T	336,501	0.0116467	0.00203029	9.67453E-09	32.90710119
Getting up in morning	6	rs620598	G	A	336,501	0.0129643	0.00223549	6.6408E-09	33.63199901
Getting up in morning	15	rs6495249	T	C	336,501	0.0116462	0.00192851	1.52626E-09	36.46907076
Getting up in morning	1	rs6666373	T	A	336,501	0.0114996	0.00209875	4.27425E-08	30.0220362
Getting up in morning	6	rs72895663	G	A	336,501	0.0122745	0.00220544	2.61511E-08	30.97541447
Getting up in morning	2	rs76048411	C	T	336,501	-0.0113077	0.00186947	1.46265E-09	36.5857157
Getting up in morning	17	rs77556405	A	G	336,501	0.0158572	0.00245564	1.06638E-10	41.69808051
Getting up in morning	9	rs77641763	T	C	336,501	-0.0192835	0.00281999	8.03711E-12	46.76022453
Getting up in morning	1	rs78555397	T	C	336,501	0.0379007	0.00543305	3.04299E-12	48.66391864
Getting up in morning	2	rs9309511	G	A	336,501	-0.0157705	0.00188709	6.28348E-17	69.89338667
Morning chronotype	2	rs10169912	G	A	301,143	0.0183096	0.00247317	1.33199E-13	54.80873438
Morning chronotype	7	rs10280205	C	T	301,143	0.0149636	0.00258998	7.93032E-09	33.7946409
Morning chronotype	2	rs10495976	T	A	301,143	-0.0141953	0.00246291	8.24138E-09	33.19421519
Morning chronotype	2	rs10520176	C	T	301,143	0.0206927	0.00239744	6.10099E-18	74.49700769
Morning chronotype	2	rs1067404	G	T	301,143	-0.0198366	0.00278591	1.0792E-12	50.69910672
Morning chronotype	2	rs10825272	A	G	301,143	0.0200075	0.00340636	4.26963E-09	34.49884556
Morning chronotype	11	rs11032362	A	G	301,143	-0.0236597	0.00416117	1.3029E-08	32.32864852
Morning chronotype	3	rs1107268	G	A	301,143	0.0134836	0.00244772	3.61885E-08	30.34507729
Morning chronotype	12	rs11181153	T	C	301,143	0.0174218	0.00242871	7.34007E-13	51.45584631
Morning chronotype	11	rs11218901	T	C	301,143	0.0190902	0.00349458	4.69008E-08	29.84221003
Morning chronotype	2	rs113851554	T	G	301,143	0.0298787	0.00533726	2.16865E-08	31.33911126
Morning chronotype	1	rs11587759	A	G	301,143	-0.0184382	0.00243904	4.05509E-14	57.14775806
Morning chronotype	11	rs11605297	A	G	301,143	0.016942	0.00282936	1.2794E-09	35.85526495
Morning chronotype	21	rs117143374	C	T	301,143	0.0196182	0.00343206	1.09051E-08	32.67447152
Morning chronotype	9	rs118723615	G	C	301,143	0.0264598	0.00432492	4.98999E-09	37.42975266
Morning chronotype	16	rs1190652	G	T	301,143	-0.0240641	0.0043932	4.31529E-08	30.00387154
Morning chronotype	1	rs12040629	A	G	301,143	-0.0302285	0.00323964	1.05755E-20	87.06421509
Morning chronotype	1	rs12140153	T	G	301,143	0.0283015	0.00415367	7.66832E-12	46.85280171
Morning chronotype	14	rs12432176	A	C	301,143	-0.0150345	0.0024691	1.14905E-09	37.05642401
Morning chronotype	16	rs12927162	G	A	301,143	0.0212584	0.00266752	1.60066E-15	63.51053636
Morning chronotype	17	rs12949341	G	A	301,143	0.0141893	0.00253803	2.6391E-08	31.25564171
Morning chron									

Table S2 TSMR estimations showing the effect of sleep traits on CRC using MR-Egger, weighted median, and IVW method

Outcomes	Exposure	Method	nSNP	OR	95% CI	P
CRC	Sleep duration	MR-Egger	41	1.0033983	0.9670600, 1.0411020	0.85788123
		Weighted median	41	0.9914062	0.9806481, 1.0022823	0.12102842
		IVW	41	0.9886117	0.9795876, 0.9977189	0.01436042
	Getting up in the morning	MR-Egger	38	1.0145915	0.9904810, 1.0392889	0.24552793
		Weighted median	38	0.9910467	0.9805800, 1.0016252	0.0968681
		IVW	38	0.9915739	0.9839520, 0.9992548	0.03160637
	Morning chronotype	MR-Egger	81	1.0033446	0.9915047, 1.015326	0.5829688
		Weighted median	81	0.996852	0.9912311, 1.002505	0.2744421
		IVW	81	0.9999212	0.9959733, 1.003885	0.9688504
	Nap during in daytime	MR-Egger	49	1.011025	0.9764247, 1.046852	0.5401725
		Weighted median	49	1.006551	0.9935782, 1.019693	0.323855
		IVW	49	1.002338	0.9927522, 1.012016	0.6338607
	Insomnia symptoms	MR-Egger	28	0.9958342	0.9661020, 1.0264814	0.78934219
		Weighted median	28	0.9878689	0.9747616, 1.0011523	0.07329211
		IVW	28	0.9877407	0.9781962, 0.9973784	0.01277894
	Snoring	MR-Egger	22	0.9525259	0.8786651, 1.032595	0.2514189
		Weighted median	22	1.0081382	0.9852082, 1.031602	0.4898914
		IVW	22	1.0102421	0.9939016, 1.026851	0.2206632
	Daytime dozing	MR-Egger	19	0.9501288	0.8559274, 1.054698	0.350354
		Weighted median	19	1.0135823	0.9886373, 1.039157	0.2886262
		IVW	19	1.003524	0.9820852, 1.025431	0.7495117
Colon cancer	Sleep duration	MR-Egger	42	0.9927038	0.9660723, 1.0200694	0.60054968
		Weighted median	42	0.9906386	0.9828026, 0.9985372	0.02027074
		IVW	42	0.9930033	0.9862591, 0.9997937	0.04345054
	Getting up in the morning	MR-Egger	39	1.0073535	0.9907762, 1.0242082	0.39238523
		Weighted median	39	0.9931279	0.9858406, 1.0004691	0.06647619
		IVW	39	0.9945195	0.9894195, 0.9996458	0.03616702
	Morning chronotype	MR-Egger	85	1.002623	0.9944050, 1.010908	0.53447766
		Weighted median	85	1.002437	0.9986449, 1.006243	0.20815437
		IVW	85	1.002487	0.9997711, 1.005211	0.07271832
	Nap during in daytime	MR-Egger	49	1.0121905	0.9868208, 1.038213	0.3542608
		Weighted median	49	0.9980264	0.9891165, 1.007017	0.6658958
		IVW	49	1.0015915	0.9945731, 1.008659	0.6575906
	Insomnia symptoms	MR-Egger	28	1.0100985	0.9896739, 1.030944	0.3438897
		Weighted median	28	0.9960123	0.9866914, 1.005421	0.416183
		IVW	28	0.9960392	0.9894699, 1.002652	0.2397966
	Snoring	MR-Egger	22	0.9535017	0.8878798, 1.023974	0.205443
		Weighted median	22	0.9912721	0.9749310, 1.007887	0.3012964
		IVW	22	0.9963969	0.9821437, 1.010857	0.6233988
	Daytime dozing	MR-Egger	19	0.9634539	0.8912088, 1.041555	0.3622855
		Weighted median	19	0.9994246	0.9813172, 1.017866	0.9508029
		IVW	19	1.0051824	0.9890055, 1.021624	0.5323372
Rectal cancer	Sleep duration	MR-Egger	42	1.0019059	0.9862467, 1.017814	0.8139357
		Weighted median	42	0.998382	0.9929389, 1.003855	0.5615444
		IVW	42	0.9969134	0.9929655, 1.000877	0.1267708
	Getting up in the morning	MR-Egger	49	0.9976079	0.9863198, 1.009025	0.68234954
		Weighted median	49	0.9988924	0.9937735, 1.004038	0.67247343
		IVW	49	0.9965183	0.9932726, 0.9997746	0.03613021
	Morning chronotype	MR-Egger	83	1.0058695	0.9993364, 1.012445	0.08212831
		Weighted median	83	1.0005947	0.9979032, 1.003293	0.66529984
		IVW	83	0.9998541	0.9978938, 1.001818	0.88411611
	Nap during in daytime	MR-Egger	39	0.9944194	0.9804827, 1.008554	0.4409675
		Weighted median	39	1.0017674	0.9962539, 1.007311	0.5305848
		IVW	39	0.9999534	0.9960543, 1.003868	0.9813495
	Insomnia symptoms	MR-Egger	29	0.9954926	0.9816438, 1.009537	0.53287983
		Weighted median	29	0.9972988	0.9909610, 1.003677	0.40564867
		IVW	29	0.995657	0.9914305, 0.9999015	0.04492115
	Snoring	MR-Egger	22	0.9952388	0.9577340, 1.034212	0.8100831
		Weighted median	22	0.9991893	0.9887835, 1.009705	0.8793068
		IVW	22	0.9996481	0.9920133, 1.007342	0.9282963
	Daytime dozing	MR-Egger	19	0.9855799	0.9489145, 1.023662	0.4629585
		Weighted median	19	0.9994117	0.9887799, 1.010158	0.9141123
		IVW	19	0.9946352	0.9868574, 1.002474	0.1792608

TSMR, two-sample MR; MR, Mendelian randomization; CRC, colorectal cancer; IVW, inverse variance weighted; nSNP, number of single nucleotide polymorphism; OR, odds ratio; CI, confidence interval.

Table S3 TSMR estimation showing the effects of CRC on different sleep traits

Exposure	Outcomes	Method	b	P value
CRC	Sleep duration	IVW	-0.088	0.84
	Getting up in morning	IVW	-0.196	0.58
	Morning chronotype	IVW	-0.148	0.81
	Nap during in daytime	IVW	0.197	0.59
	Insomnia symptoms	IVW	0.047	0.89
	Snoring	IVW	-0.235	0.38
	Daytime dozing	IVW	0.310	0.24

TSMR, two-sample MR; MR, Mendelian randomization; CRC, colorectal cancer.

Table S4 Sensitivity analysis performed by egger regression intercept and heterogeneity test

Cancer	Sleep trait	Method	Q	Q value	Egger intercept	Egger intercept P value
CRC	Sleep duration	MR-Egger	60.9623	0.01377753	-0.000200043	0.4202229
		IVW	61.99967	0.01441311		
	Getting up in morning	MR-Egger	35.65775	0.4847368	-0.000347118	0.05688999
		IVW	39.52806	0.3577014		
	Morning chronotype	MR-Egger	85.44021	0.2905501	-6.99E-05	0.5509821
		IVW	85.82808	0.3076798		
	Nap during in daytime	MR-Egger	69.41992	0.01441342	-0.000102669	0.6154958
		IVW	69.80583	0.01703598		
	Insomnia symptoms	MR-Egger	27.85621	0.3655703	-0.000107858	0.5817061
		IVW	28.18965	0.4012457		
	Snoring	MR-Egger	19.54956	0.4864048	0.000502644	0.1604579
		IVW	21.67434	0.4184801		
	Daytime dozing	MR-Egger	29.26373	0.03217032	0.000472143	0.3089034
		IVW	31.15764	0.02760162		
Colon cancer	Sleep duration	MR-Egger	73.71174	0.000924382	4.10E-06	0.9821771
		IVW	73.71267	0.001294025		
	Getting up in morning	MR-Egger	31.06853	0.7426599	-0.0001927	0.1196786
		IVW	33.60604	0.6727604		
	Morning chronotype	MR-Egger	91.1165	0.2540208	-2.74E-06	0.9728939
		IVW	91.11778	0.279115		
	Nap during in daytime	MR-Egger	78.39981	0.002743758	-0.000124773	0.4017682
		IVW	79.59404	0.002800451		
	Insomnia symptoms	MR-Egger	21.25932	0.7284574	-0.000185167	0.1670524
		IVW	23.28002	0.6698812		
	Snoring	MR-Egger	32.41277	0.03909377	0.000376226	0.2313567
		IVW	34.88226	0.02908644		
	Daytime dozing	MR-Egger	33.79812	0.008914338	0.000366398	0.2910142
		IVW	36.15929	0.006731716		
Rectal cancer	Sleep duration	MR-Egger	52.592	0.08766554	-6.78E-05	0.5241703
		IVW	53.13488	0.09699017		
	Getting up in morning	MR-Egger	32.49174	0.6803235	-1.64E-05	0.8441514
		IVW	32.53094	0.7199626		
	Morning chronotype	MR-Egger	91.44558	0.2005354	-0.000118405	0.06244257
		IVW	95.47495	0.1466398		
	Nap during in daytime	MR-Egger	51.5358	0.3008795	6.58E-05	0.4264392
		IVW	52.24154	0.3126363		
	Insomnia symptoms	MR-Egger	23.72396	0.5917462	2.18E-06	0.9807107
		IVW	23.72455	0.6455475		
	Snoring	MR-Egger	12.82976	0.8845681	3.78E-05	0.8202817
		IVW	12.88275	0.9126752		
	Daytime dozing	MR-Egger	15.38252	0.5679501	7.90E-05	0.6350427
		IVW	15.61611	0.6193198		

CRC, colorectal cancer; MR, Mendelian randomization; IVW, inverse variance weighted.