Supplementary Materials

Supplementary Methods

Data Preprocessing

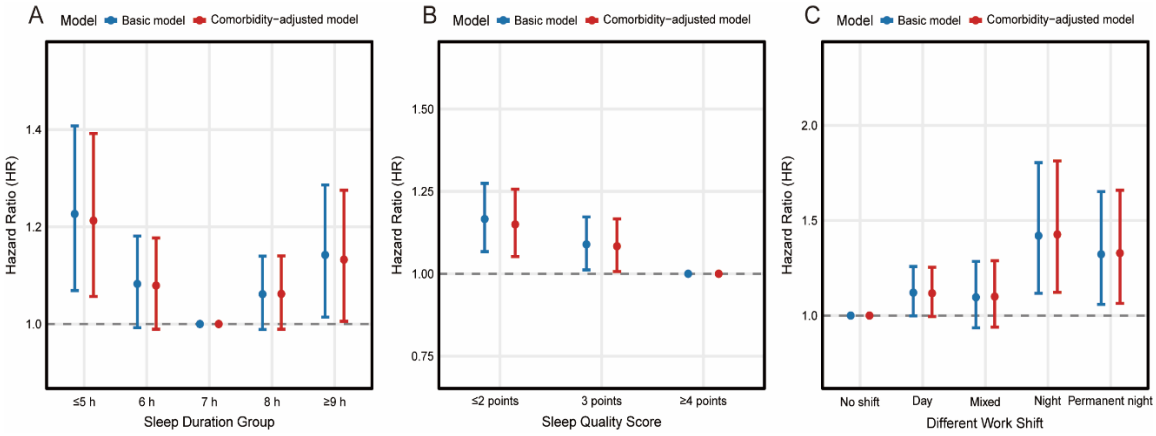
To address missing data, we used multiple imputations with predictive mean matching (PMM) to fill in missing values. Specifically, we conducted 10 imputations (m = 10) using the Multivariate Imputation by Chained Equations (MICE) algorithm. Both continuous and categorical variables were imputed. For continuous variables, PMM was applied, while predicted probability matching was used for categorical variables. After imputation, the model estimates were pooled across all imputed datasets to account for potential biases introduced by missing data.

To minimize the risk of reverse causality, individuals with pre-existing relevant conditions at baseline (e.g., diagnosed reproductive disorders, chronic diseases) were excluded from the analyses. This exclusion helped ensure that the observed associations between sleep traits and reproductive endocrine disorders (REDs) were not confounded by prior health conditions.

Genetic Instrument Sensitivity:

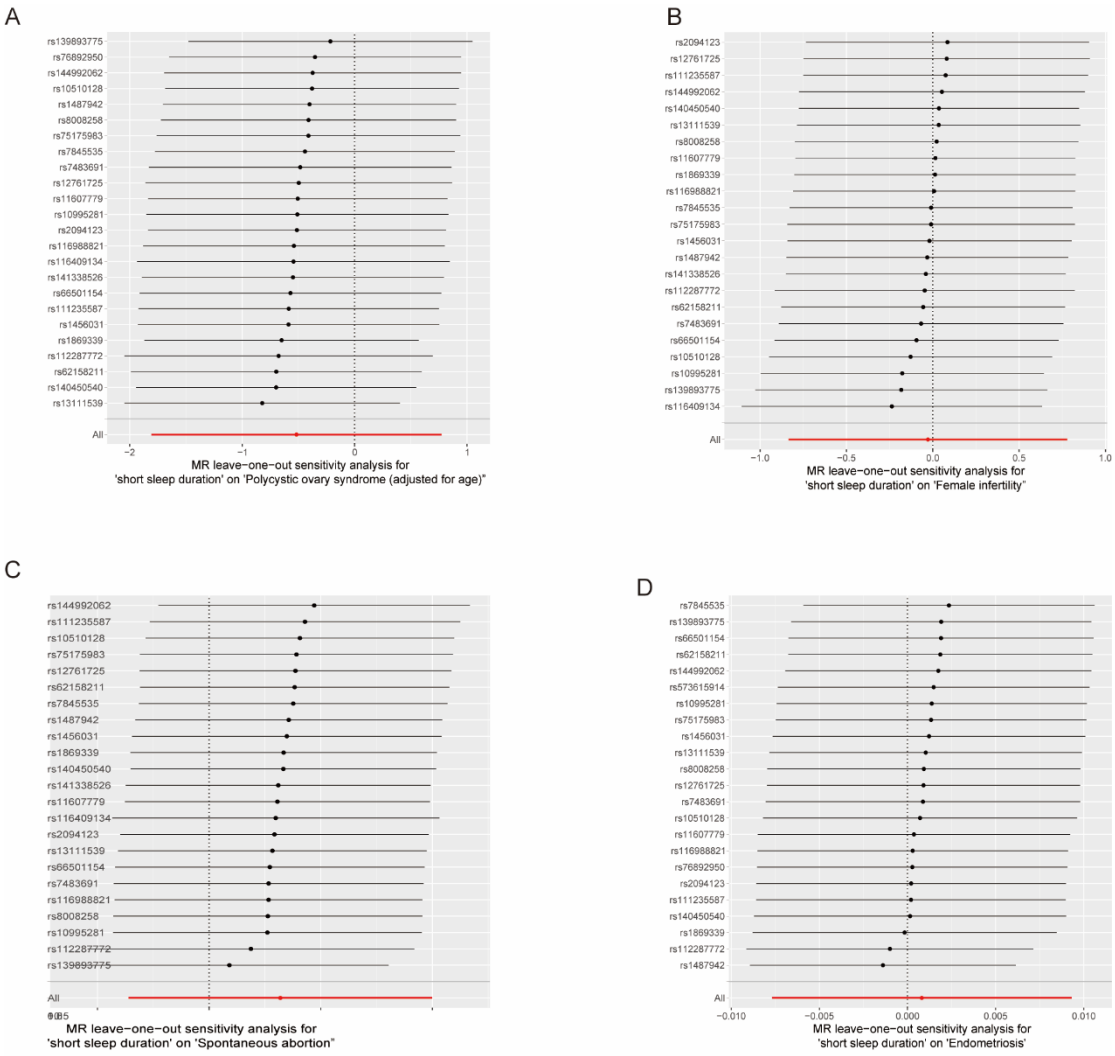
In our Mendelian Randomization (MR) analyses, we conducted a series of rigorous quality control procedures to assess the robustness of our genetic instrument selection (IVs). We employed a dual-threshold strategy for IV selection. First, single nucleotide polymorphisms (SNPs) meeting the genome-wide significance threshold ($P < 5\times10^{-8}$) were extracted as IVs. Given the limited number of exposures (long sleep duration, short sleep duration) surpassing this threshold, a second, more relaxed cutoff ($P < 1\times10^{-5}$) was applied to identify additional potential causal variants. Following initial selection, we performed linkage disequilibrium (LD) clumping ($R^2 < 0.001$,

window size = 10,000 kb) to ensure SNP independence. To exclude weak instruments, only SNPs with F statistics > 10 (calculated as $F = \beta^2/SE^2$) were retained. To mitigate potential reverse causality, SNPs significantly associated with REDs ($P < 5\times10^{-5}$) were removed. Palindromic SNPs with ambiguous strand orientations (e.g., A/T or G/C) were excluded, and allele harmonization was performed against the human genome reference (build 37). Horizontal pleiotropy was assessed via the MR-PRESSO global test, and outlier SNPs identified via the distortion test were removed before downstream MR analyses. The final IV dataset included detailed annotations for each SNP, including chromosomal position, effect allele, other allele, effect size, standard error, P value, effect allele frequency, and F statistic for subsequent causal inference.



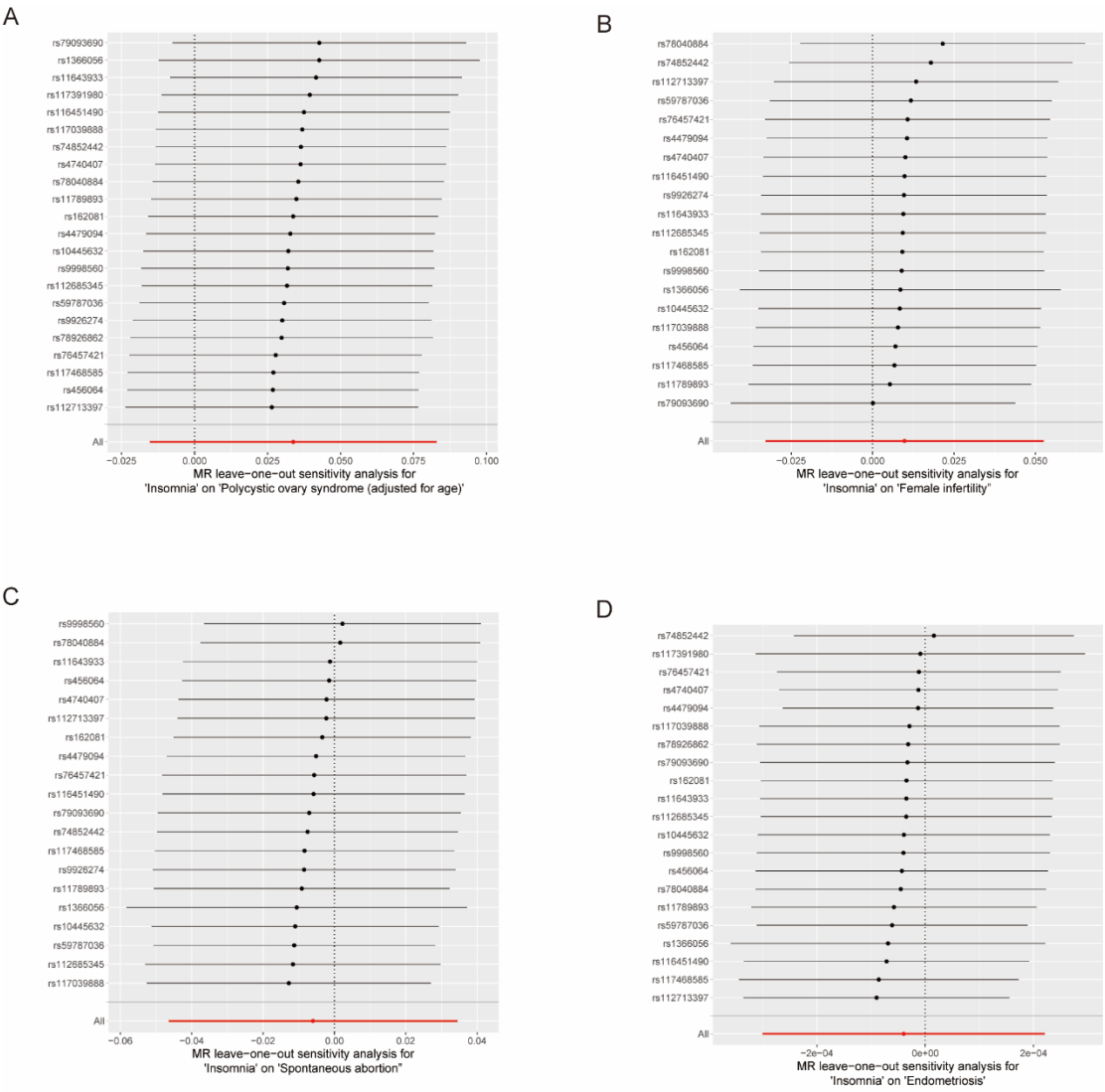
Supplementary Figure S1. Sensitivity analyses using complete-case data for associations of sleep duration, sleep quality, and shift work type with REDs risk. Hazard ratios (HRs) and 95% confidence intervals (CIs) were estimated using Cox proportional hazards models based on a complete-case dataset (excluding participants with missing covariate data), under two adjustment strategies: a basic model and a comorbidity-adjusted model. **A.** Association between sleep length and REDs risk. Both short (≤5 h) and long (≥9 h) sleep durations remained significantly associated

with increased REDs risk compared to 7 h, consistent with main analyses. **B.** Association between sleep quality and REDs risk. Lower sleep quality scores (⩽2 and 3 points) were again associated with elevated risk relative to higher scores (⩾4 points), showing a similar dose-response pattern. **C.** Association between types of shift work and REDs risk. Night shift work continued to show a significant association with higher REDs risks, while permanent night shift remained non-significant. Day and mixed shifts showed no association. Data are shown as β-estimates ± 95% CIs, with center circles and error bars. See Supplementary Table S15-16 and S18 for complete numerical results.

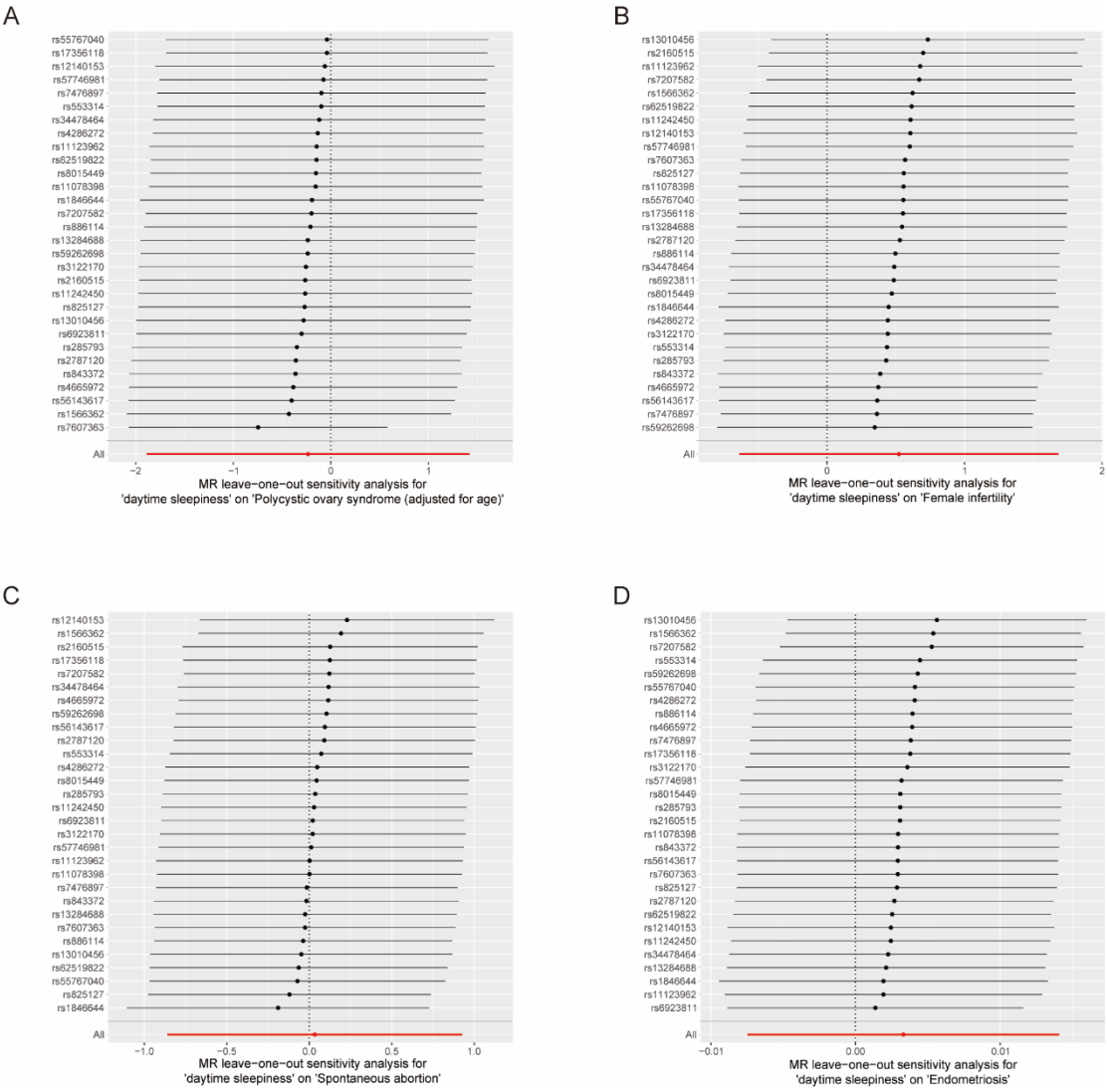


Supplementary Figure S2. Leave-one-out sensitivity analyses for the causal effect of short sleep duration on reproductive endocrine disorders. Each panel displays the results of a leave-one-out Mendelian randomisation (MR) sensitivity analysis, in which the causal estimate was recalculated by sequentially excluding each single nucleotide polymorphism (SNP) instrument. The x-axis represents the MR effect estimate and its 95% confidence interval (CI) for each leave-one-out iteration. The dashed vertical line indicates the MR estimate using all SNPs. Panels show the associations of genetically predicted short sleep duration with (A) polycystic ovary syndrome (PCOS), (B) female infertility, (C) spontaneous abortion, (D) Endometriosis. The consistency of

estimates across all iterations suggests that the observed associations are not driven by any single SNP, indicating robust causal inference.



Supplementary Figure S3. Leave-one-out sensitivity analyses for the effect of insomnia on reproductive endocrine disorders. Mendelian randomisation estimates were recalculated by excluding one SNP at a time. Results support the robustness of causal estimates. **(A)** Polycystic ovary syndrome (PCOS); **(B)** Female infertility; **(C)** Spontaneous abortion; **(D)** Endometriosis.



Supplementary Figure S4. Leave-one-out sensitivity analyses for the effect of daytime sleepiness on reproductive endocrine disorders. Mendelian randomization estimates were recalculated by excluding one SNP at a time. Results support the robustness of causal estimates. **(A)** Polycystic ovary syndrome (PCOS); **(B)** Female infertility; **(C)** Spontaneous abortion; **(D)** Endometriosis.

Supplementary Table S1. Table of International Classification of Diseases (ICD) Codes and Corresponding Data Fields	
Data-Field	**Data-Field code**
Age	21022
Sex	31
Townsend	22189
Ethnic	21000_i0
Date of death	40000_i0
Date lost to follow-up	191
Baseline date	53_i0
Assessment centre	54_i0
Neutrophils	30140
Monocytes	30130
Basophils	30160
Eosinophils	30150
Total leukocytes	30000
Neutrophil to leukocyte ratio (NLR)	30200
C-reactive protein (CRP) levels	30710
Employment status	6142
Smoking status	20116
Alcohol drinker status intake	20117
Alcohol frequency	1558
Physical activity	22040
Sleep duration (length)	1160
chronotype	1180
Sleeplessness/Insomnia	1200
Hypertension diagnosis (Vascular/heart problems diagnosed by doctor — code 4 = High blood pressure)	6150
Current medication for cholesterol, blood pressure, diabetes, or insulin (male) — code 2 = Blood pressure medication	6177
Current medication for cholesterol, blood pressure, diabetes, or insulin (female) — code 2 = Blood pressure medication	6153

Non-cancer illness code, self-reported — code 1065 = Hypertension; code 1072 = Essential hypertension	20002
Diabetes diagnosed by doctor — code 1 = Yes	2443
Current medication for cholesterol, blood pressure, diabetes, or insulin (male) — code 3 = Insulin/diabetes injection; code 4 = Diabetes tablets	6177
Current medication for cholesterol, blood pressure, diabetes, or insulin (female) — code 3 = Insulin/diabetes injection; code 4 = Diabetes tablets	6153
Non-cancer illness code, self-reported — 1220 = Diabetes (unspecified); 1222 = Type 1 diabetes; 1223 = Type 2 diabetes	20002
Snoring	1210
Daytime sleepiness/dozing	1220
Shift work status - “Does your work involve shift work?”	826
Shift work schedule - "Does your work involve night shifts?"	3426
Family history	1010
Education	6138
Medical condition	ICD9/ICD10 code
Diagnosis of hypertension	I10-I15, 401-405
History of sleep apnea	G47.3
History of depression	F32, F320, F321, F322, F323, F328, F329, F33, F330, F331, F332, F333, F334, F338, F339, F34, F340, F341, F348, F349, F38, F380, F381, F388, F39
Polycystic Ovarian Syndrome	E282
Infertility	N97
Endometriosis	N80
Menorrhagia	N92
Abortion	O03, O04, O06

Supplementary Table S2. Mapping of Sleep Questionnaire Answers to Sleep Quality Scores		
Item	**Answer Category**	**Score**
Sleep duration	7-8 h	1
	≤ 4 h	0
	5-6 h	
	≥ 9 h	
Insomnia	Never/rarely	1
	Sometimes	0
	Often	
Daytime dozing	Never/rarely	1
	Sometimes	
	Often	0
Chronotype	Morning	1
	Evening	0
Snoring	No	1
	Yes	0

Supplementary Table S3. Classification of Shift Work Types Among All Currently Employed Participants at the Time of Recruitment		
Question 1: Does your work involve shift work?	**Question 2: Does your job involve night shifts?**	**Shift work type**
Never/rarely	-	No shift work (reference category)
Sometimes	Never/rarely	Day shift
	Sometimes	Mixed shift
	Usually	Night shift
	Always	Night shift

Usually	Never/rarely	Day shift
	Sometimes	Mixed shift
	Usually	Night shift
	Always	Night shift
Always	Never/rarely	Day shift
	Sometimes	Mixed shift
	Usually	Night shift
	Always	Permanent night shift

Supplementary Table S4. Summary of GWAS Datasets for Sleep-Related Exposures and Female Reproductive Health Outcomes							
Exposures	**IEU_ID**	**Case**	**Control**	**Outcomes**	**IEU_ID**	**Case**	**Control**
daytime sleepiness	ukb-b-5776	460913		PCOS	ebi-a-GCST90044902	797	140558
Sleep duration	ukb-b-4424	460099		Female infertility	finn-b-N14_FEMALEINFERT	6481	68969
long sleep duration	ebi-a-GCST006685	10102	81204	endometriosis	ukb-b-10903	3809	459124
short sleep duration	ebi-a-GCST006686	28980	81208	Spontaneous abortion	finn-b-O15_ABORT_SPONTAN	9113	89340
Insomnia	ebi-a-GCST90018869	1402	485225	Menstrual-related issues	ukb-d-N94	1295	359899
Morning/evening person	ukb-b-4956	413343					
Nap during day	ukb-b-4616	462400					
Note: GWAS, Genome-Wide Association Study. IEU, Instrumental Variables in Epidemiology. PCOS, Polycystic Ovarian Syndrome.							

Supplementary Table S6. Baseline Characteristics of Participants		
Variable	**Level**	**Overall (n=244561)**
No. of participants	-	244561
Age	-	58.00 [51.00, 63.00]
Ethnic		
1 (White)	1	232013 (94.9%)
2 (South Asian)	2	3721 (1.5%)
3 (Black)	3	4652 (1.9%)
4 (Other ethnic)	4	4175 (1.7%)
Townsend	-	-2.20 [-3.67, 0.37]
Education		
0 (low education level)	0	152729 (62.5%)
1 (high education level)	1	91832 (37.5%)
Sleep duration		
1 (≤5h)	1	15232 (6.2%)
2 (6h)	2	44842 (18.4%)
3 (7h)	3	92025 (37.7%)
4 (8h)	4	73476 (30.1%)
5 (≥9h）	5	18600 (7.6%)
Smoking status		
0 (Never smoker)	0	146273 (59.8%)
1 (Former smoker)	1	77087 (31.5%)
2 (Current smoker)	2	21201 (8.7%)
Drinking status		
0 (Non-drinkers)	0	14023 (5.7%)
1 (Former drinkers)	1	8546 (3.5%)
2 (Current drinkers)	2	221992 (90.8%)
BMI	-	26.00 [23.38, 29.48]
Sleep score group		
0 (≤2）	0	44677 (21.8%)
1 (3)	1	79530 (38.8%)
2 (≥4）	2	80757 (39.4%)
Type of shift work		
0 (No shift work)	0	111816 (85.5%)
1 (Day shift)	1	10928 (8.4%)
2 (Mixed shift)	2	4577 (3.5%)
3 (Night shift)	3	1486 (1.1%)

4 (Permanent night shift)	4	2038 (1.6%)
Hypertension		
0 (No)	0	184684 (75.5%)
1 (Yes)	1	59877 (24.5%)
Diabetes		
0 (No)	0	239669 (98.0%)
1 (Yes)	1	4892 (2.0%)
Family depression		
0 (No)	0	208549 (85.3%)
1 (Yes)	1	36012 (14.7%)

Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.

Supplementary Table S7. Baseline Characteristics of Participants by Sleep Duration Group Based on Imputed Data Analysis							
Variable	**≤5h**	**6h**	**7h**	**8h**	**≥9**	**Total**	**p-value**
	N=15232	**N=44842**	**N=92025**	**N=73476**	**N=18600**	**N=244175**	
Age (years)	59.0 [53.0;64.0]	58.0 [52.0;63.0]	57.0 [50.0;63.0]	58.0 [50.0;63.0]	60.0 [51.0;64.0]	58.0 [51.0;63.0]	0.0000
Ethnic							0.0000
1 (White)	13735 (90.2%)	41898 (93.4%)	88151 (95.8%)	70504 (96.0%)	17726 (95.3%)	232014 (95.0%)	
2 (South Asian)	663 (4.4%)	1028 (2.3%)	1025 (1.1%)	780 (1.1%)	225 (1.2%)	3721 (1.5%)	
3 (Black)	414 (2.7%)	1011 (2.3%)	1652 (1.8%)	1206 (1.6%)	371 (2.0%)	4654 (1.9%)	
4 (Other ethnic)	420 (2.8%)	905 (2.0%)	1197 (1.3%)	986 (1.3%)	278 (1.5%)	3786 (1.6%)	
Townsend	-1.3 [-3.2;2.0]	-2.0 [-3.5;0.7]	-2.3 [-3.7;0.1]	-2.4 [-3.8;0.0]	-2.1 [-3.6;0.6]	-2.2 [-3.7;0.4]	0.0000
Education							0.0000
0 (low education level)	10705 (70.3%)	28825 (64.3%)	54638 (59.4%)	45809 (62.3%)	12463 (67.0%)	152440 (62.4%)	
1 (high education level)	4527 (29.7%)	16017 (35.7%)	37387 (40.6%)	27667 (37.7%)	6137 (33.0%)	91735 (37.6%)	
Smoking status							0.0000
0 (Never smoker)	8630 (56.7%)	25847 (57.6%)	55941 (60.8%)	44777 (60.9%)	10774 (57.9%)	145969 (59.8%)	
1 (Former smoker)	4646 (30.5%)	14629 (32.6%)	28796 (31.3%)	22949 (31.2%)	5987 (32.2%)	77007 (31.5%)	
2 (Current smoker)	1956 (12.8%)	4366 (9.7%)	7288 (7.9%)	5750 (7.8%)	1839 (9.9%)	21199 (8.7%)	
Drinking status							0.0000
0 (Non-drinkers)	1521 (10.0%)	2760 (6.2%)	4346 (4.7%)	3970 (5.4%)	1330 (7.2%)	13927 (5.7%)	
1 (Former drinkers)	933 (6.1%)	1680 (3.7%)	2685 (2.9%)	2312 (3.1%)	909 (4.9%)	8519 (3.5%)	
2 (Current drinkers)	12778 (83.9%)	40402 (90.1%)	84994 (92.4%)	67194 (91.5%)	16361 (88.0%)	221729 (90.8%)	
BMI (kg/m^2)	27.1 [24.1;31.3]	26.3 [23.5;29.9]	25.7 [23.2;29.0]	25.8 [23.3;29.2]	26.8 [23.9;30.4]	26.0 [23.4;29.5]	0.0000
Sleep Score Category							0.0000

0 (≤2）	6002 (51.4%)	18166 (49.1%)	7033 (9.0%)	5552 (8.8%)	7924 (50.5%)	44677 (21.8%)	
1 (3)	5476 (46.9%)	17351 (46.9%)	28810 (37.0%)	21841 (34.8%)	6052 (38.6%)	79530 (38.8%)	
2 (≥4）	209 (1.8%)	1495 (4.0%)	41955 (53.9%)	35378 (56.4%)	1720 (11.0%)	80757 (39.4%)	
Type of Shift Work							0.0000
0 (No shift work)	5022 (76.0%)	20696 (83.0%)	48088 (87.1%)	32593 (86.8%)	5417 (82.2%)	111816 (85.5%)	
1 (Day shift)	761 (11.5%)	2301 (9.2%)	4273 (7.7%)	2944 (7.8%)	649 (9.9%)	10928 (8.4%)	
2 (Mixed shift)	398 (6.0%)	1023 (4.1%)	1726 (3.1%)	1160 (3.1%)	270 (4.1%)	4577 (3.5%)	
3 (Night shift)	157 (2.4%)	375 (1.5%)	488 (0.9%)	360 (1.0%)	106 (1.6%)	1486 (1.1%)	
4 (Permanent night shift)	266 (4.0%)	543 (2.2%)	611 (1.1%)	473 (1.3%)	145 (2.2%)	2038 (1.6%)	
Hypertension							0.0000
0 (No)	10211 (67.0%)	32896 (73.4%)	71435 (77.6%)	56556 (77.0%)	13290 (71.5%)	184388 (75.5%)	
1 (Yes)	5021 (33.0%)	11946 (26.6%)	20590 (22.4%)	16920 (23.0%)	5310 (28.5%)	59787 (24.5%)	
Diabetes							0.0000
0 (No)	14723 (96.7%)	43912 (97.9%)	90486 (98.3%)	72164 (98.2%)	18021 (96.9%)	239306 (98.0%)	
1 (Yes)	509 (3.3%)	930 (2.1%)	1539 (1.7%)	1312 (1.8%)	579 (3.1%)	4869 (2.0%)	
Family Depression							0.0000
0 (No)	12734 (83.6%)	38062 (84.9%)	78883 (85.7%)	62974 (85.7%)	15499 (83.3%)	208152 (85.2%)	
1 (Yes)	2498 (16.4%)	6780 (15.1%)	13142 (14.3%)	10502 (14.3%)	3101 (16.7%)	36023 (14.8%)	

Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.

Supplementary Table S8. Baseline Characteristics of Participants by Sleep Score Based on Imputed Data Analysis

Variable	≤2	3	≥4	Total	*p*
	N=44677	N=79530	N=80757	N=204964	
Age (years)	58.0 [52.0;63.0]	58.0 [51.0;63.0]	57.0 [49.0;63.0]	58.0 [51.0;63.0]	0.000
Ethnic					0.000
1 (White)	42209 (94.5%)	75990 (95.5%)	77336 (95.8%)	195535 (95.4%)	
2 (South Asian)	839 (1.9%)	1024 (1.3%)	989 (1.2%)	2852 (1.4%)	
3 (Black)	836 (1.9%)	1370 (1.7%)	1424 (1.8%)	3630 (1.8%)	
4 (Other ethnic)	793 (1.8%)	1146 (1.4%)	1008 (1.2%)	2947 (1.4%)	
Townsend	-2.0 [-3.6;0.8]	-2.3 [-3.7;0.2]	-2.4 [-3.8;-0.1]	-2.2 [-3.7;0.4]	0.000
Education					0.000
0 (low education level)	29641 (66.3%)	50554 (63.6%)	47758 (59.1%)	127953 (62.4%)	
1 (high education level)	15036 (33.7%)	28976 (36.4%)	32999 (40.9%)	77011 (37.6%)	
Sleep Length Group					0.000
1 (≤5h)	6002 (13.4%)	5476 (6.9%)	209 (0.3%)	11687 (5.7%)	
2 (6h)	18166 (40.7%)	17351 (21.8%)	1495 (1.9%)	37012 (18.1%)	
3 (7h)	7033 (15.7%)	28810 (36.2%)	41955 (52.0%)	77798 (38.0%)	
4 (8h)	5552 (12.4%)	21841 (27.5%)	35378 (43.8%)	62771 (30.6%)	
5 (≥9h）	7924 (17.7%)	6052 (7.6%)	1720 (2.1%)	15696 (7.7%)	
Smoking Status					0.000
0 (Never smoker)	23640 (52.9%)	46591 (58.6%)	51915 (64.3%)	122146 (59.6%)	
1 (Former smoker)	15230 (34.1%)	26162 (32.9%)	23954 (29.7%)	65346 (31.9%)	
2 (Current smoker)	5807 (13.0%)	6777 (8.5%)	4888 (6.1%)	17472 (8.5%)	
Drinking Status					0.000

0 (Non-drinkers)	2380 (5.3%)	4190 (5.3%)	4543 (5.6%)	11113 (5.4%)	
1 (Former drinkers)	1790 (4.0%)	2635 (3.3%)	2475 (3.1%)	6900 (3.4%)	
2 (Current drinkers)	40507 (90.7%)	72705 (91.4%)	73739 (91.3%)	186951 (91.2%)	
BMI (kg/m^2)	27.3 [24.4;31.2]	26.1 [23.5;29.5]	25.2 [22.9;28.3]	26.0 [23.4;29.5]	0.000
Type of Shift Work					0.000
0 (No shift work)	18383 (81.8%)	36154 (85.9%)	40706 (87.6%)	95243 (85.8%)	
1 (Day shift)	2179 (9.7%)	3433 (8.2%)	3510 (7.6%)	9122 (8.2%)	
2 (Mixed shift)	979 (4.4%)	1414 (3.4%)	1387 (3.0%)	3780 (3.4%)	
3 (Night shift)	358 (1.6%)	451 (1.1%)	389 (0.8%)	1198 (1.1%)	
4 (Permanent night shift)	577 (2.6%)	627 (1.5%)	456 (1.0%)	1660 (1.5%)	
Hypertension					0.000
0 (No)	31177 (69.8%)	59679 (75.0%)	64393 (79.7%)	155249 (75.7%)	
1 (Yes)	13500 (30.2%)	19851 (25.0%)	16364 (20.3%)	49715 (24.3%)	
Diabetes					0.000
0 (No)	43319 (97.0%)	78057 (98.1%)	79590 (98.6%)	200966 (98.0%)	
1 (Yes)	1358 (3.0%)	1473 (1.9%)	1167 (1.4%)	3998 (2.0%)	
Family Depression					0.000
0 (No)	36866 (82.5%)	67698 (85.1%)	69872 (86.5%)	174436 (85.1%)	
1 (Yes)	7811 (17.5%)	11832 (14.9%)	10885 (13.5%)	30528 (14.9%)	
Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.					

Supplementary Table S9. Baseline Characteristics of Participants by Type of Shift Work Based on Imputed Data Analysis							
Variable	**No shift work**	**Day shift**	**Mixed shift**	**Night shift**	**Permanent night shift**	**Total**	***p***
	N=111816	**N=10928**	**N=4577**	**N=1486**	**N=2038**	**N=130845**	
Age (years)	53.0 [47.0;58.0]	53.0 [47.0;58.0]	51.0 [46.0;56.0]	51.0 [46.0;57.0]	52.0 [46.0;57.0]	58.0 [51.0;63.0]	0.000
Ethnic							0.000
1 (White)	106644 (95.4%)	10029 (91.8%)	3982 (87.0%)	1224 (82.4%)	1767 (86.7%)	123646 (94.5%)	
2 (South Asian)	1598 (1.4%)	275 (2.5%)	271 (5.9%)	119 (8.0%)	128 (6.3%)	2391 (1.8%)	
3 (Black)	1947 (1.7%)	344 (3.1%)	141 (3.1%)	69 (4.6%)	50 (2.5%)	2551 (1.9%)	
4 (Other ethnic)	1627 (1.5%)	280 (2.6%)	183 (4.0%)	74 (5.0%)	93 (4.6%)	2257 (1.7%)	
Townsend	-2.2 [-3.7; 0.2]	-1.5 [-3.2; 1.4]	-1.2 [-3.2; 1.7]	-1.2 [-3.2; 2.0]	-1.1 [-3.1; 1.9]	-2.2 [-3.7; 0.4]	0.000
Education level							0.000
0 (low education level)	63293 (56.6%)	7429 (68.0%)	3082 (67.3%)	1114 (75.0%)	1572 (77.1%)	76490 (58.5%)	
1 (high education level)	48523 (43.4%)	3499 (32.0%)	1495 (32.7%)	372 (25.0%)	466 (22.9%)	54355 (41.5%)	
Sleep duration							0.000
1 (≤5h)	5022 (4.5%)	761 (7.0%)	398 (8.7%)	157 (10.6%)	266 (13.1%)	6604 (5.0%)	
2 (6h)	20696 (18.5%)	2301 (21.1%)	1023 (22.4%)	375 (25.2%)	543 (26.6%)	24938 (19.1%)	
3 (7h)	48088 (43.0%)	4273 (39.1%)	1726 (37.7%)	488 (32.8%)	611 (30.0%)	55186 (42.2%)	
4 (8h)	32593 (29.1%)	2944 (26.9%)	1160 (25.3%)	360 (24.2%)	473 (23.2%)	37530 (28.7%)	
5 (≥9h）	5417 (4.8%)	649 (5.9%)	270 (5.9%)	106 (7.1%)	145 (7.1%)	6587 (5.0%)	

Smoking status							0.000
0 (Never smoker)	68770 (61.5%)	6200 (56.7%)	2622 (57.3%)	892 (60.0%)	1141 (56.0%)	79625 (60.9%)	
1 (Former smoker)	33651 (30.1%)	3356 (30.7%)	1296 (28.3%)	374 (25.2%)	536 (26.3%)	39213 (30.0%)	
2 (Current smoker)	9395 (8.4%)	1372 (12.6%)	659 (14.4%)	220 (14.8%)	361 (17.7%)	12007 (9.2%)	
Drinking status							0.000
0 (Non-drinkers)	4226 (3.8%)	628 (5.7%)	317 (6.9%)	143 (9.6%)	199 (9.8%)	5513 (4.2%)	
1 (Former drinkers)	2848 (2.5%)	361 (3.3%)	142 (3.1%)	51 (3.4%)	84 (4.1%)	3486 (2.7%)	
2 (Current drinkers)	104742 (93.7%)	9939 (90.9%)	4118 (90.0%)	1292 (86.9%)	1755 (86.1%)	121846 (93.1%)	
BMI (kg/m^2)	25.5 [23.0;29.0]	26.2 [23.5;30.0]	26.3 [23.5;30.3]	26.7 [23.9;30.6]	27.1 [24.1;31.3]	26.0 [23.4;29.5]	0.000
Sleep score							0.000
0 (≤2）	18383 (19.3%)	2179 (23.9%)	979 (25.9%)	358 (29.9%)	577 (34.8%)	22476 (20.2%)	
1 (3)	36154 (38.0%)	3433 (37.6%)	1414 (37.4%)	451 (37.6%)	627 (37.8%)	42079 (37.9%)	
2 (≥4）	40706 (42.7%)	3510 (38.5%)	1387 (36.7%)	389 (32.5%)	456 (27.5%)	46448 (41.8%)	
Hypertension							0.000
0 (No)	91926 (82.2%)	8802 (80.5%)	3755 (82.0%)	1206 (81.2%)	1624 (79.7%)	107313 (82.0%)	
1 (Yes)	19890 (17.8%)	2126 (19.5%)	822 (18.0%)	280 (18.8%)	414 (20.3%)	23532 (18.0%)	
Diabetes							0.000
0 (No)	110374 (98.7%)	10750 (98.4%)	4504 (98.4%)	1450 (97.6%)	1999 (98.1%)	129077 (98.6%)	
1 (Yes)	1442 (1.3%)	178 (1.6%)	73 (1.6%)	36 (2.4%)	39 (1.9%)	1768 (1.4%)	
Family depression							0.001

0 (No)	94842 (84.8%)	9096 (83.2%)	3864 (84.4%)	1265 (85.1%)	1730 (84.9%)	110797 (84.7%)	
1 (Yes)	16974 (15.2%)	1832 (16.8%)	713 (15.6%)	221 (14.9%)	308 (15.1%)	20048 (15.3%)	

Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.

Supplementary Table S10. Baseline Characteristics of Participants by Sleep Duration Group Based on Complete Data Analysis

Variable	≤5h	6h	7h	8h	≥9	Total	*p*-value
	N=9889	N=34666	N=76626	N=58828	N=13405	N=193414)	
Age (years)	58.0 [51.0;63.0]	57.0 [51.0;62.0]	56.0 [49.0;62.0]	57.0 [49.0;62.0]	58.0 [50.0;63.0]	57.0 [49.0;62.0]	0
Ethnic							
1 (White)	8880 (89.8%)	32297 (93.2%)	73409 (95.8%)	56507 (96.1%)	12769 (95.3%)	183862 (95.1%)	0
2 (South Asian)	473 (4.8%)	863 (2.5%)	889 (1.2%)	622 (1.1%)	173 (1.3%)	3020 (1.6%)	
3 (Black)	249 (2.5%)	760 (2.2%)	1323 (1.7%)	900 (1.5%)	251 (1.9%)	3483 (1.8%)	
4 (Other ethnic)	287 (2.9%)	746 (2.2%)	1005 (1.3%)	799 (1.4%)	212 (1.6%)	3049 (1.6%)	
Townsend	-1.8 [-3.5;1.2]	-2.2 [-3.7;0.4]	-2.4 [-3.8;-0.0]	-2.5 [-3.8;-0.2]	-2.3 [-3.7;0.2]	-2.4 [-3.8;0.0]	0
Education							
0 (low education level)	7136 (72.2%)	22051 (63.6%)	44672 (58.3%)	36150 (61.5%)	8969 (66.9%)	118978 (61.5%)	0
1 (high education level)	2753 (27.8%)	12615 (36.4%)	31954 (41.7%)	22678 (38.5%)	4436 (33.1%)	74436 (38.5%)	
Smoking status							
0 (Never smoker)	5839 (59.0%)	20600 (59.4%)	47686 (62.2%)	36802 (62.6%)	8063 (60.1%)	118990 (61.5%)	0

1 (Former smoker)	2997 (30.3%)	11064 (31.9%)	23427 (30.6%)	17859 (30.4%)	4183 (31.2%)	59530 (30.8%)	
2 (Current smoker)	1053 (10.6%)	3002 (8.7%)	5513 (7.2%)	4167 (7.1%)	1159 (8.6%)	14894 (7.7%)	
Drinking status							
0 (Non-drinkers)	819 (8.3%)	1858 (5.4%)	3122 (4.1%)	2620 (4.5%)	809 (6.0%)	9228 (4.8%)	0
1 (Former drinkers)	533 (5.4%)	1158 (3.3%)	1998 (2.6%)	1613 (2.7%)	589 (4.4%)	5891 (3.0%)	
2 (Current drinkers)	8537 (86.3%)	31650 (91.3%)	71506 (93.3%)	54595 (92.8%)	12007 (89.6%)	178295 (92.2%)	
BMI (kg/m^2)	26.9 [23.9;31.0]	26.0 [23.3;29.7]	25.5 [23.0;28.8]	25.6 [23.1;28.8]	26.4 [23.7;30.0]	25.7 [23.2;29.1]	0
Sleep Score Category							
0 (≤2）	3927 (50.6%)	14017 (48.7%)	5717 (8.8%)	4235 (8.4%)	5564 (48.9%)	33460 (20.5%)	0
1 (3)	3691 (47.5%)	13503 (46.9%)	23887 (36.8%)	17266 (34.2%)	4455 (39.2%)	62802 (38.4%)	
2 (≥4）	145 (1.9%)	1251 (4.3%)	35389 (54.5%)	29043 (57.5%)	1359 (11.9%)	67187 (41.1%)	
Type of Shift Work							
0 (No shift work)	3989 (76.4%)	17866 (83.3%)	43258 (87.4%)	28797 (87.0%)	4592 (82.3%)	98502 (85.8%)	0
1 (Day shift)	575 (11.0%)	1922 (9.0%)	3703 (7.5%)	2532 (7.6%)	522 (9.4%)	9254 (8.1%)	
2 (Mixed shift)	337 (6.5%)	886 (4.1%)	1554 (3.1%)	1052 (3.2%)	243 (4.4%)	4072 (3.5%)	
3 (Night shift)	123 (2.4%)	324 (1.5%)	433 (0.9%)	327 (1.0%)	95 (1.7%)	1302 (1.1%)	
4 (Permanent night shift)	200 (3.8%)	451 (2.1%)	538 (1.1%)	410 (1.2%)	125 (2.2%)	1724 (1.5%)	
Hypertension							
0 (No)	6959 (70.4%)	26272 (75.8%)	61014 (79.6%)	46586 (79.2%)	9987 (74.5%)	150818 (78.0%)	0
1 (Yes)	2930 (29.6%)	8394 (24.2%)	15612 (20.4%)	12242 (20.8%)	3418 (25.5%)	42596 (22.0%)	
Diabetes							

0 (No)	9611 (97.2%)	34024 (98.1%)	75483 (98.5%)	57936 (98.5%)	13049 (97.3%)	190103 (98.3%)	0
1 (Yes)	278 (2.8%)	642 (1.9%)	1143 (1.5%)	892 (1.5%)	356 (2.7%)	3311 (1.7%)	
Family Depression							
0 (No)	8138 (82.3%)	29211 (84.3%)	65351 (85.3%)	50114 (85.2%)	11029 (82.3%)	163843 (84.7%)	0
1 (Yes)	1751 (17.7%)	5455 (15.7%)	11275 (14.7%)	8714 (14.8%)	2376 (17.7%)	29571 (15.3%)	

Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.

Supplementary Table S11. Baseline Characteristics of Participants by Sleep Score Group Based on Complete Data Analysis

Variable	≤2	3	≥4	Total	p-value
	N=33460	N=62802	N=67187	N=163449	
Age (years)	57.0 [50.0;62.0]	57.0 [50.0;62.0]	55.0 [48.0;62.0]	57.0 [49.0;62.0]	0
Ethnic					
1 (White)	31524 (94.2%)	59936 (95.4%)	64378 (95.8%)	155838 (95.3%)	0
2 (South Asian)	676 (2.0%)	845 (1.3%)	840 (1.3%)	2361 (1.4%)	
3 (Black)	626 (1.9%)	1063 (1.7%)	1126 (1.7%)	2815 (1.7%)	
4 (Other ethnic)	634 (1.9%)	958 (1.5%)	843 (1.3%)	2435 (1.5%)	
Townsend	-2.2 [-3.7;0.4]	-2.4 [-3.8;-0.1]	-2.5 [-3.8;-0.3]	-2.4 [-3.8;0.0]	0
Education					
0 (low education level)	22099 (66.0%)	39491 (62.9%)	38949 (58.0%)	100539 (61.5%)	0

1 (high education level)	11361 (34.0%)	23311 (37.1%)	28238 (42.0%)	62910 (38.5%)	
Sleep Length Group					
1 (≤5h)	3927 (11.7%)	3691 (5.9%)	145 (0.2%)	7763 (4.7%)	0
2 (6h)	14017 (41.9%)	13503 (21.5%)	1251 (1.9%)	28771 (17.6%)	
3 (7h)	5717 (17.1%)	23887 (38.0%)	35389 (52.7%)	64993 (39.8%)	
4 (8h)	4235 (12.7%)	17266 (27.5%)	29043 (43.2%)	50544 (30.9%)	
5 (≥9h）	5564 (16.6%)	4455 (7.1%)	1359 (2.0%)	11378 (7.0%)	
Smoking Status					
0 (Never smoker)	18463 (55.2%)	37803 (60.2%)	44065 (65.6%)	100331 (61.4%)	0
1 (Former smoker)	11136 (33.3%)	20236 (32.2%)	19421 (28.9%)	50793 (31.1%)	
2 (Current smoker)	3861 (11.5%)	4763 (7.6%)	3701 (5.5%)	12325 (7.5%)	
Drinking Status					
0 (Non-drinkers)	1532 (4.6%)	2777 (4.4%)	3185 (4.7%)	7494 (4.6%)	0
1 (Former drinkers)	1134 (3.4%)	1829 (2.9%)	1839 (2.7%)	4802 (2.9%)	
2 (Current drinkers)	30794 (92.0%)	58196 (92.7%)	62163 (92.5%)	151153 (92.5%)	
BMI (kg/m^2)	27.1 [24.2;31.0]	25.8 [23.3;29.2]	25.0 [22.7;28.0]	25.7 [23.2;29.1]	0
Type of Shift Work					
0 (No shift work)	15569 (82.1%)	31674 (86.2%)	36909 (87.8%)	84152 (86.1%)	0
1 (Day shift)	1765 (9.3%)	2888 (7.9%)	3095 (7.4%)	7748 (7.9%)	
2 (Mixed shift)	849 (4.5%)	1257 (3.4%)	1280 (3.0%)	3386 (3.5%)	
3 (Night shift)	302 (1.6%)	403 (1.1%)	354 (0.8%)	1059 (1.1%)	
4 (Permanent night shift)	471 (2.5%)	538 (1.5%)	409 (1.0%)	1418 (1.5%)	

Hypertension					
0 (No)	24227 (72.4%)	48601 (77.4%)	54929 (81.8%)	127757 (78.2%)	0
1 (Yes)	9233 (27.6%)	14201 (22.6%)	12258 (18.2%)	35692 (21.8%)	
Diabetes					
0 (No)	32577 (97.4%)	61793 (98.4%)	66332 (98.7%)	160702 (98.3%)	0
1 (Yes)	883 (2.6%)	1009 (1.6%)	855 (1.3%)	2747 (1.7%)	
Family Depression					
0 (No)	27320 (81.6%)	53135 (84.6%)	57841 (86.1%)	138296 (84.6%)	0
1 (Yes)	6140 (18.4%)	9667 (15.4%)	9346 (13.9%)	25153 (15.4%)	
Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.					

Supplementary Table S12. Baseline Characteristics of Participants by Type of Shift Work Based on Complete Data Analysis

Variable	No shift work	Day shift	Mixed shift	Night shift	Permanent night shift	Total	p-value
	N=98502	N=9254	N=4072	N=1302	N=1724	N=114854	
Age (years)	52.0 [47.0;57.0]	52.0 [47.0;57.0]	51.0 [45.5;56.0]	50.0 [45.0;56.0]	51.0 [46.0;57.0]	57.0 [49.0;62.0]	0
Ethnic							
1 (White)	93957 (95.4%)	8513 (92.0%)	3545 (87.1%)	1080 (82.9%)	1493 (86.6%)	108588 (94.5%)	0
2 (South Asian)	1432 (1.5%)	234 (2.5%)	247 (6.1%)	106 (8.1%)	113 (6.6%)	2132 (1.9%)	

3 (Black)	1686 (1.7%)	271 (2.9%)	122 (3.0%)	58 (4.5%)	38 (2.2%)	2175 (1.9%)	
4 (Other ethnic)	1427 (1.4%)	236 (2.6%)	158 (3.9%)	58 (4.5%)	80 (4.6%)	1959 (1.7%)	
Townsend	-2.3 [-3.7;0.1]	-1.6 [-3.3;1.2]	-1.4 [-3.2;1.6]	-1.2 [-3.2;1.8]	-1.3 [-3.2;1.7]	-2.4 [-3.8;0.0]	0
Education level							
0 (low education level)	54933 (55.8%)	6386 (69.0%)	2754 (67.6%)	997 (76.6%)	1373 (79.6%)	66443 (57.8%)	0
1 (high education level)	43569 (44.2%)	2868 (31.0%)	1318 (32.4%)	305 (23.4%)	351 (20.4%)	48411 (42.2%)	
Sleep duration							
1 (≤5h)	3989 (4.0%)	575 (6.2%)	337 (8.3%)	123 (9.4%)	200 (11.6%)	5224 (4.5%)	0
2 (6h)	17866 (18.1%)	1922 (20.8%)	886 (21.8%)	324 (24.9%)	451 (26.2%)	21449 (18.7%)	
3 (7h)	43258 (43.9%)	3703 (40.0%)	1554 (38.2%)	433 (33.3%)	538 (31.2%)	49486 (43.1%)	
4 (8h)	28797 (29.2%)	2532 (27.4%)	1052 (25.8%)	327 (25.1%)	410 (23.8%)	33118 (28.8%)	
5 (≥9h）	4592 (4.7%)	522 (5.6%)	243 (6.0%)	95 (7.3%)	125 (7.3%)	5577 (4.9%)	
Smoking status							
0 (Never smoker)	61738 (62.7%)	5382 (58.2%)	2379 (58.4%)	792 (60.8%)	985 (57.1%)	71276 (62.1%)	0
1 (Former smoker)	29131 (29.6%)	2809 (30.4%)	1142 (28.0%)	325 (25.0%)	456 (26.5%)	33863 (29.5%)	
2 (Current smoker)	7633 (7.7%)	1063 (11.5%)	551 (13.5%)	185 (14.2%)	283 (16.4%)	9715 (8.5%)	
Drinking status							
0 (Non-drinkers)	3445 (3.5%)	487 (5.3%)	277 (6.8%)	121 (9.3%)	171 (9.9%)	4501 (3.9%)	0
1 (Former drinkers)	2395 (2.4%)	296 (3.2%)	124 (3.0%)	43 (3.3%)	66 (3.8%)	2924 (2.5%)	
2 (Current drinkers)	92662 (94.1%)	8471 (91.5%)	3671 (90.2%)	1138 (87.4%)	1487 (86.3%)	107429 (93.5%)	
BMI (kg/m^2)	25.4 [22.9;28.8]	26.0 [23.4;29.8]	26.3 [23.4;30.3]	26.6 [23.8;30.5]	27.1 [24.1;31.2]	25.7 [23.2;29.1]	0

Sleep score							
0 (≤2）	15569 (18.5%)	1765 (22.8%)	849 (25.1%)	302 (28.5%)	471 (33.2%)	18956 (19.4%)	0
1 (3)	31674 (37.6%)	2888 (37.3%)	1257 (37.1%)	403 (38.1%)	538 (37.9%)	36760 (37.6%)	
2 (≥4）	36909 (43.9%)	3095 (39.9%)	1280 (37.8%)	354 (33.4%)	409 (28.8%)	42047 (43.0%)	
Hypertension							
0 (No)	81912 (83.2%)	7534 (81.4%)	3360 (82.5%)	1072 (82.3%)	1406 (81.6%)	95284 (83.0%)	0
1 (Yes)	16590 (16.8%)	1720 (18.6%)	712 (17.5%)	230 (17.7%)	318 (18.4%)	19570 (17.0%)	
Diabetes							
0 (No)	97279 (98.8%)	9105 (98.4%)	4012 (98.5%)	1274 (97.8%)	1695 (98.3%)	113365 (98.7%)	0.001
1 (Yes)	1223 (1.2%)	149 (1.6%)	60 (1.5%)	28 (2.2%)	29 (1.7%)	1489 (1.3%)	
Family depression							
0 (No)	83273 (84.5%)	7672 (82.9%)	3429 (84.2%)	1109 (85.2%)	1457 (84.5%)	96940 (84.4%)	0.001
1 (Yes)	15229 (15.5%)	1582 (17.1%)	643 (15.8%)	193 (14.8%)	267 (15.5%)	17914 (15.6%)	

Note: Data are presented as median [interquartile range] for continuous variables and n (%) for categorical variables. BMI: Body Mass Index.

Supplementary Table S13.1. The Association Between Sleep Duration and the Risk of Reproductive Endocrine Diseases: Model 1 (Adjusted for Age, Socioeconomic Factors, Lifestyle Factors, and BMI) Based on Imputed Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep length)	0 (7h)	92025 (37.7%)	
	1 (≤5)	15232 (6.2%)	1.17 (1.03-1.32, p=.014)
	2 (6h)	44842 (18.4%)	1.08 (0.99-1.17, p=.077)
	3 (8h)	73476 (30.1%)	1.07 (1.00-1.15, p=.045)
	4(≥9h）	18600 (7.6%)	1.17 (1.05-1.31, p=.004)
Age	Mean ± SD	56.7 ± 8.0	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.4 ± 3.0	1.01 (1.00-1.02, p=.011)
Ethnic	Mean ± SD	1.1 ± 0.5	1.08 (1.03-1.13, p=.001)
Education	Mean ± SD	0.4 ± 0.5	0.88 (0.83-0.93, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.7	0.96 (0.92-1.00, p=.056)
Drinking_status	Mean ± SD	1.9 ± 0.5	0.99 (0.93-1.04, p=.613)
BMI	Mean ± SD	26.9 ± 5.0	1.03 (1.03-1.04, p<.001)
Note: n=244175, events=4981, Likelihood ratio test=7089.95 on 11 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S13.2. The Association Between Sleep Duration and the Risk of Reproductive Endocrine Diseases: Model 2 (Further Adjusted for Comorbidities) Based on Imputed Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep length)	0 (7h)	92025 (37.7%)	
	1 (≤5)	15232 (6.2%)	1.15 (1.02-1.31, p=.024)
	2 (6h)	44842 (18.4%)	1.07 (0.99-1.16, p=.097)
	3 (8h)	73476 (30.1%)	1.07 (1.00-1.15, p=.045)
	4(≥9h）	18600 (7.6%)	1.16 (1.04-1.29, p=.007)
Age	Mean ± SD	56.7 ± 8.0	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.4 ± 3.0	1.01 (1.00-1.02, p=.028)
Ethnic	Mean ± SD	1.1 ± 0.5	1.08 (1.03-1.13, p=.001)
Education	Mean ± SD	0.4 ± 0.5	0.87 (0.82-0.92, p<.001)

Smoking_status	Mean ± SD	0.5 ± 0.7	0.96 (0.92-1.00, p=.042)
Drinking_status	Mean ± SD	1.9 ± 0.5	0.98 (0.93-1.04, p=.593)
BMI	Mean ± SD	26.9 ± 5.0	1.03 (1.03-1.04, p<.001)
diabetes	Mean ± SD	0.0 ± 0.1	1.12 (0.93-1.36, p=.241)
hypertension	Mean ± SD	0.2 ± 0.4	1.14 (1.05-1.23, p=.001)
family_depression	Mean ± SD	0.1 ± 0.4	1.15 (1.07-1.24, p<.001)
Note: n=244175, events=4981, Likelihood ratio test=7121.06 on 14 df(p<.001). BMI, Body Mass Index			

Supplementary Table S14.1. The Association Between Sleep Score and the Risk of Reproductive Endocrine Diseases: Model 1 (Adjusted for Age, Socioeconomic Factors, Lifestyle Factors, and BMI) Based on Imputed Data Analysis

Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep score)	0 (≤2）	80757 (39.4%)	
	1 (3)	79530 (38.8%)	1.11 (1.03-1.19, p=.004)
	2 (≥4）	44677 (21.8%)	1.15 (1.06-1.25, p=.001)
Age	Mean ± SD	56.6 ± 8.0	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.5 ± 3.0	1.01 (1.00-1.02, p=.107)
Ethnic	Mean ± SD	1.1 ± 0.5	1.06 (1.01-1.12, p=.023)
Education	Mean ± SD	0.4 ± 0.5	0.88 (0.82-0.93, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.96 (0.92-1.01, p=.088)
Drinking_status	Mean ± SD	1.9 ± 0.5	0.96 (0.90-1.03, p=.229)
BMI	Mean ± SD	26.9 ± 5.0	1.03 (1.03-1.04, p<.001)
Note: n=204964, events=4174, Likelihood ratio test=5880.63 on 9 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S14.2. The Association Between Sleep Score and the Risk of Reproductive Endocrine Diseases: Model 2 (Further Adjusted for Comorbidities) Based on Imputed Data Analysis

Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep score)	0 (≤2）	80757 (39.4%)	
	1 (3)	79530 (38.8%)	1.10 (1.03-1.18, p=.007)

	2 (≥4）	44677 (21.8%)	1.13 (1.04-1.23, p=.003)
Age	Mean ± SD	56.6 ± 8.0	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.5 ± 3.0	1.01 (1.00-1.02, p=.208)
Ethnic	Mean ± SD	1.1 ± 0.5	1.07 (1.01-1.12, p=.017)
Education	Mean ± SD	0.4 ± 0.5	0.86 (0.81-0.92, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.96 (0.92-1.00, p=.070)
Drinking_status	Mean ± SD	1.9 ± 0.5	0.96 (0.90-1.02, p=.222)
BMI	Mean ± SD	26.9 ± 5.0	1.03 (1.02-1.04, p<.001)
diabetes	Mean ± SD	0.0 ± 0.1	1.12 (0.90-1.38, p=.317)
hypertension	Mean ± SD	0.2 ± 0.4	1.12 (1.03-1.23, p=.007)
family_depression	Mean ± SD	0.1 ± 0.4	1.18 (1.09-1.27, p<.001)
Note: n=204964, events=4174, Likelihood ratio test=5908.43 on 12 df(p<.001). BMI, Body Mass Index			

Supplementary Table S15.1. The Association Between Sleep Duration and the Risk of Reproductive Endocrine Diseases: Model 1 (Adjusted for Age, Socioeconomic Factors, Lifestyle Factors, and BMI) Based on Complete Data Analysis

Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep length)	0 (7h)	76626 (39.6%)	
	1 (≤5)	9889 (5.1%)	1.23 (1.07-1.41, p=.004)
	2 (6h)	34666 (17.9%)	1.08 (0.99-1.18, p=.073)
	3 (8h)	58828 (30.4%)	1.06 (0.99-1.14, p=.100)
	4(≥9h）	13405 (6.9%)	1.14 (1.01-1.29, p=.028)
Age	Mean ± SD	55.7 ± 7.9	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.6 ± 2.9	1.01 (1.00-1.02, p=.005)
Ethnic	Mean ± SD	1.1 ± 0.5	1.09 (1.04-1.15, p=.001)
Education	Mean ± SD	0.4 ± 0.5	0.86 (0.81-0.92, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.95 (0.90-0.99, p=.018)
Drinking_status	Mean ± SD	1.9 ± 0.5	0.99 (0.93-1.06, p=.743)
BMI	Mean ± SD	26.6 ± 5.0	1.03 (1.03-1.04, p<.001)
Note: n=193414, events=4380, Likelihood ratio test=5803.41 on 11 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S15.2. The Association Between Sleep Duration and the Risk of Reproductive Endocrine Diseases: Model 2 (Further Adjusted for Comorbidities) Based on Complete Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep length)	0 (7h)	76626 (39.6%)	
	1 (≤5)	9889 (5.1%)	1.21 (1.06-1.39, p=.006)
	2 (6h)	34666 (17.9%)	1.08 (0.99-1.18, p=.086)
	3 (8h)	58828 (30.4%)	1.06 (0.99-1.14, p=.097)
	4(≥9h）	13405 (6.9%)	1.13 (1.01-1.28, p=.040)
Age	Mean ± SD	55.7 ± 7.9	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.6 ± 2.9	1.01 (1.00-1.02, p=.009)
Ethnic	Mean ± SD	1.1 ± 0.5	1.09 (1.04-1.15, p=.001)
Education	Mean ± SD	0.4 ± 0.5	0.86 (0.81-0.92, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.94 (0.90-0.99, p=.014)
Drinking_status	Mean ± SD	1.9 ± 0.5	0.99 (0.93-1.06, p=.741)
BMI	Mean ± SD	26.6 ± 5.0	1.03 (1.03-1.04, p<.001)
diabetes	Mean ± SD	0.0 ± 0.1	1.06 (0.85-1.32, p=.633)
hypertension	Mean ± SD	0.2 ± 0.4	1.15 (1.05-1.25, p=.002)
family_depression	Mean ± SD	0.2 ± 0.4	1.14 (1.06-1.23, p=.001)
Note: n=193414, events=4380, Likelihood ratio test=5824.59 on 14 df(p<.001). BMI, Body Mass Index			

Supplementary Table S16.1. The Association Between Sleep Score and the Risk of Reproductive Endocrine Diseases: Model 1 (Adjusted for Age, Socioeconomic Factors, Lifestyle Factors, and BMI) Based on Complete Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep score)	0 (≤2）	67187 (41.1%)	
	1 (3)	62802 (38.4%)	1.09 (1.01-1.17, p=.023)
	2 (≥4）	33460 (20.5%)	1.17 (1.07-1.27, p=.001)
Age	Mean ± SD	55.6 ± 7.9	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.7 ± 2.9	1.01 (1.00-1.02, p=.052)
Ethnic	Mean ± SD	1.1 ± 0.5	1.07 (1.02-1.14, p=.012)
Education	Mean ± SD	0.4 ± 0.5	0.86 (0.80-0.92, p<.001)

Smoking_status	Mean ± SD	0.5 ± 0.6	0.95 (0.90-0.99, p=.030)
Drinking_status	Mean ± SD	1.9 ± 0.4	0.98 (0.91-1.05, p=.534)
BMI	Mean ± SD	26.6 ± 4.9	1.03 (1.03-1.04, p<.001)
Note: n=163449, events=3700, Likelihood ratio test=4827.35 on 9 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S16.2. The Association Between Sleep Score and the Risk of Reproductive Endocrine Diseases: Model 2 (Further Adjusted for Comorbidities) Based on Complete Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Group (Sleep score)	0 (≤2）	67187 (41.1%)	
	1 (3)	62802 (38.4%)	1.08 (1.01-1.17, p=.033)
	2 (≥4）	33460 (20.5%)	1.15 (1.05-1.26, p=.002)
Age	Mean ± SD	55.6 ± 7.9	0.85 (0.85-0.86, p<.001)
Townsend	Mean ± SD	-1.7 ± 2.9	1.01 (1.00-1.02, p=.077)
Ethnic	Mean ± SD	1.1 ± 0.5	1.07 (1.02-1.14, p=.012)
Education	Mean ± SD	0.4 ± 0.5	0.86 (0.80-0.92, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.94 (0.90-0.99, p=.024)
Drinking_status	Mean ± SD	1.9 ± 0.4	0.98 (0.91-1.05, p=.536)
BMI	Mean ± SD	26.6 ± 4.9	1.03 (1.02-1.04, p<.001)
diabetes	Mean ± SD	0.0 ± 0.1	1.03 (0.80-1.31, p=.829)
hypertension	Mean ± SD	0.2 ± 0.4	1.14 (1.04-1.26, p=.005)
family_depression	Mean ± SD	0.2 ± 0.4	1.17 (1.08-1.27, p<.001)
Note: n=163449, events=3700, Likelihood ratio test=4848.66 on 12 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S17.1. The Association Between Type of Shift Work and the Risk of Reproductive Endocrine Diseases: Model 1 (Adjusted for Age, Socioeconomic Factors, Lifestyle Factors, and BMI) Based on Imputed Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Type of Shift Work	0 (No shift work)	111816 (85.5%)	
	1 (Day shift)	10928 (8.4%)	1.10 (0.98-1.23, p=.096)
	2 (Mixed shift)	4577 (3.5%)	1.06 (0.91-1.24, p=.445)

	3 (Night shift)	1486 (1.1%)	1.39 (1.11-1.75, p=.005)
	4 (Permanent night shift.)	2038 (1.6%)	1.21 (0.98-1.51, p=.082)
Age	Mean ± SD	52.6 ± 6.9	0.85 (0.84-0.85, p<.001)
Townsend	Mean ± SD	-1.3 ± 3.0	1.01 (1.00-1.02, p=.223)
Ethnic	Mean ± SD	1.1 ± 0.5	1.08 (1.02-1.14, p=.009)
Education	Mean ± SD	0.4 ± 0.5	0.89 (0.83-0.95, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.7	0.94 (0.89-0.99, p=.010)
Drinking_status	Mean ± SD	1.9 ± 0.4	0.99 (0.92-1.07, p=.820)
BMI	Mean ± SD	26.6 ± 5.0	1.03 (1.03-1.04, p<.001)
Note: n=130845, events=3858, Likelihood ratio test=3910.68 on 11 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S17.2. The Association Between Type of Shift Work and the Risk of Reproductive Endocrine Diseases: Model 2 (Further Adjusted for Comorbidities) Based on Imputed Data Analysis

Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Type of Shift Work	0 (No shift work)	111816 (85.5%)	
	1 (Day shift)	10928 (8.4%)	1.09 (0.98-1.22, p=.109)
	2 (Mixed shift)	4577 (3.5%)	1.06 (0.91-1.24, p=.430)
	3 (Night shift)	1486 (1.1%)	1.40 (1.11-1.76, p=.004)
	4 (Permanent night shift.)	2038 (1.6%)	1.22 (0.98-1.51, p=.076)
Age	Mean ± SD	52.6 ± 6.9	0.85 (0.84-0.85, p<.001)
Townsend	Mean ± SD	-1.3 ± 3.0	1.00 (0.99-1.02, p=.380)
Ethnic	Mean ± SD	1.1 ± 0.5	1.08 (1.02-1.14, p=.006)
Education	Mean ± SD	0.4 ± 0.5	0.89 (0.83-0.95, p<.001)
Smoking_status	Mean ± SD	0.5 ± 0.7	0.94 (0.90-0.99, p=.011)
Drinking_status	Mean ± SD	1.9 ± 0.4	0.99 (0.92-1.07, p=.817)
BMI	Mean ± SD	26.6 ± 5.0	1.03 (1.02-1.04, p<.001)
diabetes	Mean ± SD	0.0 ± 0.1	1.21 (0.95-1.54, p=.119)
hypertension	Mean ± SD	0.2 ± 0.4	1.14 (1.04-1.25, p=.005)
family_depression	Mean ± SD	0.2 ± 0.4	1.13 (1.04-1.23, p=.004)
Note: n=130845, events=3858, Likelihood ratio test=3930.94 on 14 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S18.1. The Association Between Type of Shift Work and the Risk of Reproductive Endocrine Diseases: Model 1 (Adjusted for Age, Socioeconomic Factors, Lifestyle Factors, and BMI) Based on Complete Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Type of Shift Work	0 (No shift work)	98502 (85.8%)	
	1 (Day shift)	9254 (8.1%)	1.12 (1.00-1.26, p=.054)
	2 (Mixed shift)	4072 (3.5%)	1.10 (0.94-1.28, p=.255)
	3 (Night shift)	1302 (1.1%)	1.42 (1.12-1.80, p=.004)
	4 (Permanent night shift.)	1724 (1.5%)	1.32 (1.06-1.65, p=.014)
Age	Mean ± SD	52.2 ± 6.8	0.85 (0.84-0.85, p<.001)
Townsend	Mean ± SD	-1.4 ± 2.9	1.01 (1.00-1.02, p=.114)
Ethnic	Mean ± SD	1.1 ± 0.5	1.08 (1.02-1.15, p=.007)
Education	Mean ± SD	0.4 ± 0.5	0.89 (0.83-0.95, p=.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.93 (0.88-0.97, p=.003)
Drinking_status	Mean ± SD	1.9 ± 0.4	0.99 (0.92-1.07, p=.790)
BMI	Mean ± SD	26.5 ± 5.0	1.03 (1.03-1.04, p<.001)
Note: n=114854, events=3536, Likelihood ratio test=3394.72 on 11 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S18.2. The Association Between Type of Shift Work and the Risk of Reproductive Endocrine Diseases: Model 2 (Further Adjusted for Comorbidities) Based on Complete Data Analysis			
Variable		n (%) or Mean ± SD	HR (95% CI), p-value
Type of Shift Work	0 (No shift work)	98502 (85.8%)	
	1 (Day shift)	9254 (8.1%)	1.12 (1.00-1.25, p=.060)
	2 (Mixed shift)	4072 (3.5%)	1.10 (0.94-1.29, p=.239)
	3 (Night shift)	1302 (1.1%)	1.43 (1.12-1.81, p=.004)
	4 (Permanent night shift.)	1724 (1.5%)	1.33 (1.06-1.66, p=.012)
Age	Mean ± SD	52.2 ± 6.8	0.85 (0.84-0.85, p<.001)
Townsend	Mean ± SD	-1.4 ± 2.9	1.01 (1.00-1.02, p=.146)
Ethnic	Mean ± SD	1.1 ± 0.5	1.08 (1.02-1.15, p=.008)
Education	Mean ± SD	0.4 ± 0.5	0.89 (0.83-0.95, p=.001)
Smoking_status	Mean ± SD	0.5 ± 0.6	0.92 (0.88-0.97, p=.003)

Drinking_status	Mean ± SD	1.9 ± 0.4	0.99 (0.91-1.07, p=.783)
BMI	Mean ± SD	26.5 ± 5.0	1.03 (1.02-1.04, p<.001)
diabetes	Mean ± SD	0.0 ± 0.1	1.13 (0.87-1.47, p=.344)
hypertension	Mean ± SD	0.2 ± 0.4	1.17 (1.06-1.28, p=.002)
family_depression	Mean ± SD	0.2 ± 0.4	1.12 (1.02-1.22, p=.012)
Note: n=114854, events=3536, Likelihood ratio test=3411.39 on 14 df(p<.001). BMI, Body Mass Index.			

Supplementary Table S19.1. Joint association of sleep duration and shift work with reproductive endocrine disorders (reference: 7 h & No shift work) — Main Effects Model						
Variable	Coef (β)	Exp(Coefficient) (HR)	SE (Coef)	z	p-value	95% CI (HR)
sleep length 7h	Reference					
sleep length ≤5 h	0.22693	1.2547	0.088683	2.559	0.010501 *	1.0546 - 1.4929
sleep length 6 h	0.082815	1.0863	0.051879	1.596	0.110417	0.9813 - 1.2026
sleep length 8 h	0.031674	1.0322	0.042083	0.753	0.451646	0.9505 - 1.1209
sleep length ≥9 h	0.132427	1.1416	0.077619	1.706	0.087984 .	0.9805 - 1.3292
Type of shift work: no shift work	Reference					
Type of shift work: Day shift	0.151188	1.1632	0.087869	1.721	0.085324 .	0.9792 - 1.3818
Type of shift work: Mixed shift	0.129109	1.1378	0.124642	1.036	0.300278	0.8912 - 1.4527
Type of shift work: Night shift	0.446219	1.5624	0.194666	2.292	0.021893 *	1.0668 - 2.2882
Type of shift work: Permanent night	0.051521	1.0529	0.215315	0.239	0.810887	0.6904 - 1.6057
Age	-0.166615	0.8465	0.003112	-53.537	< 2e-16 ***	0.8414 - 0.8517
Townsend	0.00528	1.0053	0.00541	0.976	0.329116	0.9947 - 1.0160
Ethnic	0.072334	1.075	0.028092	2.575	0.010026 *	1.0174 - 1.1359
Education	-0.121217	0.8858	0.033456	-3.623	0.000291 ***	0.8296 - 0.9459
Smoking_status	-0.062575	0.9393	0.02468	-2.535	0.011231 *	0.8950 - 0.9859
Drinking_status	-0.006902	0.9931	0.037697	-0.183	0.854723	0.9224 - 1.0693
BMI	0.03104	1.0315	0.002862	10.847	< 2e-16 ***	1.0258 - 1.0373
≤5 h× Day shift	-0.322046	0.7247	0.259435	-1.241	0.214481	0.4358 - 1.2049
6 h × Day shift	-0.055961	0.9456	0.151918	-0.368	0.712602	0.7021 - 1.2735
7h × Day shift	Reference					
8 h × Day shift	-0.055452	0.9461	0.137002	-0.405	0.68566	0.7233 - 1.2375
≥9 h × Day shift	-0.289692	0.7485	0.241588	-1.199	0.230481	0.4662 - 1.2018

≤5 h× Mixed shift	-0.467412	0.6266	0.336811	-1.388	0.165211	0.3238 - 1.2126
6 h × Mixed shift	-0.148871	0.8617	0.212506	-0.701	0.483586	0.5681 - 1.3069
7 h × Mixed shift	0.028723	0.9544	0.231141	0.173	0.812213	0.8711-1.2318
8 h × Mixed shift	0.051682	1.053	0.188982	0.273	0.784486	0.7271 - 1.5251
≥9 h × Mixed shift	-0.512289	0.5991	0.381727	-1.342	0.179587	0.2835 - 1.2660
≤5 h × Night shift	0.334452	1.7157	0.163233	2.772	0.004119**	1.3062 - 2.1731
6 h × Night shift	0.221545	1.356	0.143485	1.264	0.026208*	1.1341 - 1.9261
7 h × Night shift	0.145781	1.1452	0.156612	0.344	0.058182	0.9133-1.5119
8 h × Night shift	0.064811	1.067	0.290297	0.223	0.823336	0.6040 - 1.8847
≥9 h × Night shift	0.34727	0.7066	0.493041	-0.704	0.481219	0.2688 - 1.8572
≤5 h × Permanent night	0.223857	1.2509	0.169692	1.606	0.004832*	1.1161 - 2.5817
6 h × Permanent night	0.187676	1.1476	0.306	1.245	0.052767.	0.9630 - 2.0905
7 h × Permanent night	0.201845	1.1205	0.221924	0.913	0.561133	0.8408 - 1.2115
8 h× Permanent night	0.100908	1.1062	0.316018	0.319	0.74949	0.5954 - 2.0550
≥9 h × Permanent night	0.280153	1.3233	0.403309	0.695	0.487284	0.6003 - 2.9172

Note: Data are hazard ratios (HRs) from Cox models with an interaction term, adjusted for age, Townsend deprivation index, ethnicity, education level, smoking status, drinking status, BMI.

Bold indicates $p < 0.05$. REDs: reproductive endocrine disorders. Reference: 7 h sleep × No shift work. Coef (β), Coefficient (Beta). Exp(Coefficient) (HR), Exponentiated Coefficient (Hazard Ratio).

SE (Coef), Standard Error (Coefficient). z, z-value. 95% CI (HR), 95% Confidence Interval (Hazard Ratio).

Supplementary Table S19.2. Joint association of sleep duration and shift work with reproductive endocrine disorders (reference: 7 h & No shift work) — Model Adjusted for Comorbidities

Variable	Coef (β)	Exp(Coefficient) (HR)	SE (Coef)	z	p-value	95% CI (HR)
sleep length 7h	Reference					
sleep length ≤5 h	0.218092	1.2437	0.088728	2.458	**0.013972 ***	1.0452 - 1.4799

sleep length 6 h	0.079578	1.0828	0.051887	1.534	0.125105	0.9781 - 1.1987
sleep length 8 h	0.0321	1.0326	0.042083	0.763	0.445588	0.9509 - 1.1214
sleep length ≥9 h	0.127369	1.1358	0.07763	1.641	0.100858	0.9755 - 1.3225
Type of shift work: no shift work	Reference					
Type of shift work: Day shift	0.147436	1.1589	0.087879	1.678	0.093403 .	0.9755 - 1.3767
Type of shift work: Mixed shift	0.12949	1.1382	0.12464	1.039	0.298846	0.8915 - 1.4532
Type of shift work: Night shift	0.453211	1.5734	0.19468	2.328	**0.019913 ***	1.0743 - 2.3043
Type of shift work: Permanent night	0.055091	1.0566	0.215323	0.256	0.798065	0.6929 - 1.6114
Age	-0.16781	0.8455	0.003144	-53.377	**< 2e-16 *** **	0.8403 - 0.8507
Townsend	0.004633	1.0046	0.005412	0.856	0.391931	0.994 - 1.0154
Ethnic	0.0716	1.0742	0.028115	2.547	0.010875	1.0166 - 1.1351
Education	-0.120767	0.8862	0.033477	-3.623	**0.000309 *** **	0.83 - 0.9463
Smoking status	-0.063618	0.9384	0.02468	-2.535	**0.010013 ***	0.894 - 0.9849
Drinking_status	-0.006893	0.9931	0.03772	-0.183	0.855003	0.9224 - 1.0693
BMI	0.028815	1.0292	0.002945	9.783	**< 2e-16 *** **	1.0233 - 1.0352
diabetes	0.184002	1.202	0.122618	1.501	0.133455	0.9452 - 1.5286
hypertension	0.127663	1.1362	0.047574	2.683	**0.007287 ****	1.035 - 1.2472
Family depression	0.112572	1.1192	0.043002	2.618	**0.00885 ****	1.0287 - 1.2176
≤5 h× Day shift	-0.320634	0.7257	0.25944	-1.236	0.216507	0.4364 - 1.2067
6 h × Day shift	-0.052832	0.9485	0.151923	-0.348	0.728024	0.7043 - 1.2775
7h × Day shift	**Reference**					
8 h × Day shift	-0.053822	0.9476	0.137003	-0.393	0.694428	0.7244 - 1.2395
≥9 h × Day shift	-0.28496	0.752	0.241594	-1.179	0.238201	0.4684 - 1.2075
≤5 h× Mixed shift	-0.459174	0.6318	0.336815	-1.363	0.172794	0.3265 - 1.2226
6 h × Mixed shift	-0.145884	0.8643	0.21251	-0.686	0.492408	0.5698 - 1.3108

7 h × Mixed shift	0.028145	0.9588	0.231566	0.183	0.840113	0.8723 - 1.2411
8 h × Mixed shift	0.053798	1.0553	0.188985	0.273	0.775898	0.7286 - 1.5284
≥9 h × Mixed shift	-0.508013	0.6017	0.38173	-1.331	0.183249	0.2847 - 1.2715
≤5 h × Night shift	0.332692	1.7131	0.16234	2.769	**0.004425****	**1.3067 - 2.1762**
6 h × Night shift	0.226601	1.352	0.15495	1.279	**0.026083***	1.1345 - 1.9549
7 h × Night shift	0.148912	**1.1471**	0.143228	0.365	**0.059115**	**0.91141-1.5105**
8 h × Night shift	0.059052	1.0608	0.290312	0.223	0.838817	0.6005 - 1.874
≥9 h × Night shift	-0.350926	0.704	0.493045	-0.712	0.476619	0.2688 - 1.8504
≤5 h × Permanent night	0.224839	1.2521	0.369702	0.608	0.543081	0.6067 - 2.5843
6 h × Permanent night	0.13683	1.1466	0.306013	0.447	0.654775	0.6294 - 2.0888
7 h × Permanent night	0.184745	1.1274	0.223773	0.944	0.567741	0.8471 - 1.3013
8 h× Permanent night	0.099433	1.1045	0.316022	0.315	0.753037	0.5945 - 2.052
≥9 h × Permanent night	0.293508	1.3411	0.40332	0.728	0.466779	0.6084 - 2.9565

Data are hazard ratios (HRs) from Cox models with an interaction term, adjusted for age, Townsend deprivation index, ethnicity, education level, smoking status, drinking status, BMI, diabetes, hypertension, and family history of depression.

Bold indicates $p < 0.05$. REDs: reproductive endocrine disorders. Reference: 7 h sleep × No shift work.

Supplementary Table S20.1 Mediation Effects of Inflammatory Biomarkers Linking long Sleep Duration (≤5 h) to REDs (Reference: 7 h)

Mediator	Average Causal Mediation Effect Estimate	Average Causal Mediation Effect Confidence Interval	Average Causal Mediation Effect P-value	Average Direct Effect Estimate	Average Direct Effect Confidence Interval	Average Direct Effect P-value	Total Effect Estimate	Total Effect Confidence Interval	Total Effect P-value	Proportion Mediated	Proportion Mediated Confidence Interval	Proportion Mediated P-value
Neutrophils	1788.99477	1138.418~2646.064	< 0.001	13576.82	2690.332~31753.613	0.04	15134.2	3294.224~33568.977	< 0.001	11.82%	4.60% ~ 37.30%	< 0.001
Monocytes	79.582727	4.877~168.833	0.02	15320.24	2607.927~29408.191	0.04	15384.21	2665.621~29459.637	0.04	0.50%	0 ~ 1.50%	0.06
Basophils	138.191175	31.764~341.412	0.02	14567.78	1766.792~26135.219	0.02	14679.51	1948.325~26210.518	0.02	0.86%	0.10% ~ 6.30%	0.04
Eosinophils	-6.972294	-70.187 ~ 35.589	0.74	14869.65	3465.587 ~ 25573.531	< 0.001	-14874.6	-25581.256 ~ -3479.764	< 0.001	0.01%	-0.20% ~ 0.50%	0.74
Leukocytes	847.68707	402.823~1558.544	< 0.001	15623.98	4219.969~28524.574	< 0.001	16290.41	4770.277~29636.56	< 0.001	5.28%	3.10% ~ 14.0%	< 0.001
NLR	600.704173	257.246~1092.135	< 0.001	14378.53	1696.194~31819.72	0.04	14862.66	2166.079~32456.712	0.02	3.79%	1.80% ~ 7.10%	0.02
CRP	1587.08616	892.246 ~ 2400.945	0.02	15821.76	4269.829~31526.914	< 0.001	15993.18	3388.256~30833.817	< 0.001	9.92%	0.70%~17.1%	0.02

Supplementary Table S20.2. Mediation Effects of Inflammatory Biomarkers Linking Short Sleep Duration (≥9 h) to REDs (Reference: 7 h)

Mediator	Average Causal Mediation Effect Estimate	Average Causal Mediation Effect Confidence Interval	Average Causal Mediation Effect P-value	Average Direct Effect Estimate	Average Direct Effect Confidence Interval	Average Direct Effect P-value	Total Effect Estimate	Total Effect Confidence Interval	Total Effect P-value	Proportion Mediated	Proportion Mediated Confidence Interval	Proportion Mediated P-value
Neutrophils	2202.81185	333.018~2371.591	< 0.001	14934.03	1138.953~35706.449	0.02	16977.09	1687.137~37443.032	0.02	12.98%	8.10% ~ 37.20%	0.02

Leukocytes	822.234802	555.96~1224.438	< 0.001	14051.15	3072.975~31541.167	0.12	14798.99	-2569.268~32050.155	0.12	5.56%	- 19.4% ~ 16.00%	0.12
NLR	264.32669	27.115~653.519	0.02	15029.29	1267.823~32170.241	< 0.001	15245.7	1511.558~32368.868	< 0.001	1.68%	0.20% ~ 15.0%	0.02
Basophils	0.8911883	-158.165 ~ 172.358	0.92	16661.02	150.871~36005.65	0.06	16660.33	125.338~36094.877	0.06	0.03%	-1.20% ~ 1.30%	0.86
Monocytes	5.1342359	-49.612 ~ 72.555	0.84	16434.35	233.308~34536.759	0.06	16430.36	228.223~34524.374	0.06	0.02%	-0.60% ~ 0.60%	0.86
Eosinophils	7.633866	-108.584 ~ 124.91	0.9	16028.46	2168.78~29115.399	0.02	16021.93	2179.356~29130.172	0.02	0.06%	-0.23% ~ 1.21%	0.88
CRP	1557.10573	942.45 ~ 2107.073	0.04	21952.88	9705.63~47001.339	< 0.001	22714.07	9331.336~46368.575	< 0.001	6.86%	1.41% ~ 7.51%	< 0.001

Supplementary Table S20.3 Mediation Analysis of Inflammatory Biomarkers in the Association Between Night Shift Work and REDs

Mediator	Average Causal Mediation Effect Estimate	Average Causal Mediation Effect Confidence Interval	Average Causal Mediation Effect P-value	Average Direct Effect Estimate	Average Direct Effect Confidence Interval	Average Direct Effect P-value	Total Effect Estimate	Total Effect Confidence Interval	Total Effect P-value	Proportion Mediated	Proportion Mediated Confidence Interval	Proportion Mediated P-value
Neutrophils	1391.46634	512.776 ~1935.637	0.04	20011.2	5981.036~33938.065	< 0.001	21240.99	7312.242~35257.956	< 0.001	6.55%	3.60% ~ 12.70%	0.04
Monocytes	10.30997	-39.703 ~ 61.624	0.74	19513.44	8613.798~32453.382	< 0.001	19519.32	8626.902~32453.103 ~	< 0.001	0.05%	-0.40% ~ 0.20%	0.74
Basophils	19.04493	-28.995 ~ 159.734	0.9	19221.58	5720.859~35562.143	< 0.001	19210.11	5701.792~35596.358	< 0.001	0.10%	-1.10% ~ 1.40%	0.9
Eosinophils	19.42077	-14.711 ~ 105.136	0.64	22026.04	4338.243~35479.82	0.02	22013.02	4285.121~35450.87	0.02	0.09%	-0.40% ~ 1.30%	0.62
Leukocytes	88.7466	-3.96 ~ 210.652	0.08	19502.27	6267.361~34558.874	0.02	19556.37	6359.194~34595.212	0.02	0.45%	-0.90% ~ 1.70%	0.1
NLR	357.06589	19.461 ~ 878.327	0.06	20209.02	6301.533~38699.778	< 0.001	20425.01	6828.586~38913.953	< 0.001	1.75%	-0.30% ~ 4.30%	0.06
CRP	102.49491	-90.108 ~ 424.223	0.24	21298.31	8064.924~33041.166	< 0.001	21358.39	8167.931~33040.441	< 0.001	0.48%	-2.90% ~ 2.40%	0.24

Note: NLR, Neutrophil-to-Lymphocyte Ratio. CRP, C-reactive Protein. REDs: reproductive endocrine diseases.

Supplementary Tabel S21. Summary of Mendelian Randomization (MR) results for the association between sleep duration, sleep traits and reproductive endocrine diseases.

Exposure ID (GWAS)	Outcome ID (GWAS)	Outcome	Exposure	Method	Number of SNPs Used	Causal Effect Estimate (Beta)	Standard Error of the Estimate	P-value	Lower 95% Confidence Interval for Beta	Upper 95% Confidence Interval for Beta	Odds Ratio (if applicable; exp(beta))	Lower 95% Confidence Interval for Odds Ratio	Upper 95% Confidence Interval for Odds Ratio
ukb-b-5776	ukb-b-10903	endometriosis || id:ukb-b-10903	daytime sleepiness	MR Egger	30	0.0339	0.0244	0.1756	-0.0139	0.0818	1.0345	0.9862	1.0853
ukb-b-5776	ukb-b-10903	endometriosis || id:ukb-b-10903	daytime sleepiness	Weighted median	30	0.0138	0.0073	0.0575	-0.0004	0.0280	1.0139	0.9996	1.0284
ukb-b-5776	ukb-b-10903	endometriosis || id:ukb-b-10903	daytime sleepiness	Inverse variance weighted	30	0.0033	0.0055	0.5484	-0.0075	0.0141	1.0033	0.9925	1.0142
ukb-b-5776	ukb-b-10903	endometriosis || id:ukb-b-10903	daytime sleepiness	Simple mode	30	0.0185	0.0140	0.1955	-0.0089	0.0459	1.0187	0.9912	1.0469
ukb-b-5776	ukb-b-10903	endometriosis || id:ukb-b-10903	daytime sleepiness	Weighted mode	30	0.0185	0.0121	0.1367	-0.0052	0.0422	1.0187	0.9948	1.0431
ukb-b-5776	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	daytime sleepiness	MR Egger	30	-0.4392	2.7212	0.8729	-5.7728	4.8943	0.6445	0.0031	133.5248
ukb-b-5776	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	daytime sleepiness	Weighted median	30	0.1142	0.7586	0.8804	-1.3727	1.6010	1.1209	0.2534	4.9581
ukb-b-5776	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	daytime sleepiness	Inverse variance weighted	30	0.5226	0.5923	0.3776	-0.6383	1.6834	1.6863	0.5282	5.3839
ukb-b-5776	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	daytime sleepiness	Simple mode	30	-0.5659	1.5728	0.7216	-3.6485	2.5168	0.5679	0.0260	12.3884
ukb-b-5776	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	daytime sleepiness	Weighted mode	30	-0.3234	1.3247	0.8089	-2.9197	2.2730	0.7237	0.0539	9.7087

ukb-b-5776	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	daytime sleepiness	MR Egger	30	0.0250	0.0168	0.1483	-0.0080	0.0579	1.0253	0.9921	1.0596
ukb-b-5776	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	daytime sleepiness	Weighted median	30	0.0049	0.0054	0.3639	-0.0057	0.0155	1.0049	0.9943	1.0157
ukb-b-5776	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	daytime sleepiness	Inverse variance weighted	30	0.0042	0.0038	0.2591	-0.0031	0.0116	1.0042	0.9969	1.0117
ukb-b-5776	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	daytime sleepiness	Simple mode	30	-0.0045	0.0111	0.6887	-0.0262	0.0172	0.9955	0.9741	1.0174
ukb-b-5776	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	daytime sleepiness	Weighted mode	30	0.0010	0.0099	0.9238	-0.0185	0.0204	1.0010	0.9817	1.0206
ukb-b-5776	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	daytime sleepiness	MR Egger	30	-4.4685	3.6784	0.2346	-11.6782	2.7412	0.0115	0.0000	15.5057
ukb-b-5776	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	daytime sleepiness	Weighted median	30	-0.6905	1.0062	0.4926	-2.6626	1.2817	0.5013	0.0698	3.6028
ukb-b-5776	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	daytime sleepiness	Inverse variance weighted	30	-0.2339	0.8445	0.7818	-1.8891	1.4213	0.7915	0.1512	4.1425
ukb-b-5776	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	daytime sleepiness	Simple mode	30	-1.2365	1.8332	0.5053	-4.8295	2.3565	0.2904	0.0080	10.5535
ukb-b-5776	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	daytime sleepiness	Weighted mode	30	-1.2365	1.4798	0.4102	-4.1369	1.6638	0.2904	0.0160	5.2795

ukb-b-5776	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	daytime sleepiness	MR Egger	30	-0.5099	2.0980	0.8098	-4.6219	3.6022	0.6006	0.0098	36.6789
ukb-b-5776	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	daytime sleepiness	Weighted median	30	0.5511	0.6479	0.3950	-0.7188	1.8210	1.7351	0.4873	6.1777
ukb-b-5776	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	daytime sleepiness	Inverse variance weighted	30	0.0334	0.4561	0.9416	-0.8606	0.9274	1.0340	0.4229	2.5279
ukb-b-5776	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	daytime sleepiness	Simple mode	30	0.9102	1.3710	0.5120	-1.7770	3.5974	2.4848	0.1691	36.5035
ukb-b-5776	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	daytime sleepiness	Weighted mode	30	1.2002	1.2752	0.3544	-1.2992	3.6996	3.3209	0.2728	40.4327
ebi-a-GCST90018869	ukb-b-10903	endometriosis || id:ukb-b-10903	Insomnia	MR Egger	7	0.0002	0.0011	0.8376	-0.0019	0.0023	1.0002	0.9981	1.0023
ebi-a-GCST90018869	ukb-b-10903	endometriosis || id:ukb-b-10903	Insomnia	Weighted median	7	0.0004	0.0004	0.4191	-0.0005	0.0012	1.0004	0.9995	1.0012
ebi-a-GCST90018869	ukb-b-10903	endometriosis || id:ukb-b-10903	Insomnia	Inverse variance weighted	7	0.0002	0.0005	0.6307	-0.0007	0.0012	1.0002	0.9993	1.0012
ebi-a-GCST90018869	ukb-b-10903	endometriosis || id:ukb-b-10903	Insomnia	Simple mode	7	0.0010	0.0007	0.2131	-0.0004	0.0024	1.0010	0.9996	1.0024
ebi-a-GCST90018869	ukb-b-10903	endometriosis || id:ukb-b-10903	Insomnia	Weighted mode	7	0.0005	0.0004	0.3126	-0.0004	0.0013	1.0005	0.9996	1.0013

ebi-a-GCST90018869	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Insomnia	MR Egger	20	-0.0176	0.0405	0.6687	-0.0971	0.0618	0.9825	0.9075	1.0637
ebi-a-GCST90018869	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Insomnia	Weighted median	20	0.0146	0.0335	0.6624	-0.0511	0.0803	1.0147	0.9502	1.0837
ebi-a-GCST90018869	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Insomnia	Inverse variance weighted	20	0.0098	0.0218	0.6526	-0.0329	0.0525	1.0099	0.9676	1.0539
ebi-a-GCST90018869	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Insomnia	Simple mode	20	0.0186	0.0477	0.7012	-0.0749	0.1120	1.0187	0.9278	1.1186
ebi-a-GCST90018869	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Insomnia	Weighted mode	20	0.0161	0.0371	0.6682	-0.0566	0.0888	1.0163	0.9450	1.0929
ebi-a-GCST90018869	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Insomnia	MR Egger	21	0.0000	0.0002	0.9104	-0.0005	0.0004	1.0000	0.9995	1.0004
ebi-a-GCST90018869	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Insomnia	Weighted median	21	-0.0001	0.0002	0.4444	-0.0005	0.0002	0.9999	0.9995	1.0002
ebi-a-GCST90018869	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Insomnia	Inverse variance weighted	21	0.0000	0.0001	0.7650	-0.0003	0.0002	1.0000	0.9997	1.0002
ebi-a-GCST90018869	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Insomnia	Simple mode	21	-0.0001	0.0003	0.6068	-0.0007	0.0004	0.9999	0.9993	1.0004

ebi-a-GCST90018869	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Insomnia	Weighted mode	21	-0.0001	0.0002	0.6007	-0.0005	0.0003	0.9999	0.9995	1.0003
ebi-a-GCST90018869	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Insomnia	MR Egger	22	0.0007	0.0450	0.9869	-0.0875	0.0890	1.0007	0.9162	1.0930
ebi-a-GCST90018869	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Insomnia	Weighted median	22	0.0163	0.0385	0.6723	-0.0591	0.0917	1.0164	0.9426	1.0960
ebi-a-GCST90018869	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Insomnia	Inverse variance weighted	22	0.0338	0.0251	0.1775	-0.0153	0.0829	1.0344	0.9848	1.0864
ebi-a-GCST90018869	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Insomnia	Simple mode	22	-0.0031	0.0641	0.9617	-0.1287	0.1225	0.9969	0.8792	1.1303
ebi-a-GCST90018869	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Insomnia	Weighted mode	22	0.0064	0.0485	0.8965	-0.0887	0.1015	1.0064	0.9151	1.1068
ebi-a-GCST90018869	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Insomnia	MR Egger	20	0.0147	0.0390	0.7110	-0.0618	0.0911	1.0148	0.9401	1.0954
ebi-a-GCST90018869	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Insomnia	Weighted median	20	0.0060	0.0285	0.8338	-0.0500	0.0619	1.0060	0.9513	1.0639
ebi-a-GCST90018869	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Insomnia	Inverse variance weighted	20	-0.0060	0.0207	0.7710	-0.0465	0.0345	0.9940	0.9546	1.0351

ebi-a-GCST90018869	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Insomnia	Simple mode	20	0.0165	0.0546	0.7661	-0.0905	0.1235	1.0166	0.9135	1.1314
ebi-a-GCST90018869	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Insomnia	Weighted mode	20	0.0126	0.0324	0.7028	-0.0510	0.0761	1.0126	0.9503	1.0791
ebi-a-GCST006685	ukb-b-10903	endometriosis || id:ukb-b-10903	long sleep duration	MR Egger	11	0.0314	0.0558	0.5870	-0.0780	0.1408	1.0319	0.9250	1.1512
ebi-a-GCST006685	ukb-b-10903	endometriosis || id:ukb-b-10903	long sleep duration	Weighted median	11	-0.0186	0.0114	0.1033	-0.0409	0.0038	0.9816	0.9599	1.0038
ebi-a-GCST006685	ukb-b-10903	endometriosis || id:ukb-b-10903	long sleep duration	Inverse variance weighted	11	-0.0175	0.0087	0.0454	-0.0346	-0.0004	0.9827	0.9660	0.9996
ebi-a-GCST006685	ukb-b-10903	endometriosis || id:ukb-b-10903	long sleep duration	Simple mode	11	-0.0262	0.0177	0.1687	-0.0609	0.0084	0.9741	0.9409	1.0085
ebi-a-GCST006685	ukb-b-10903	endometriosis || id:ukb-b-10903	long sleep duration	Weighted mode	11	-0.0253	0.0187	0.2060	-0.0619	0.0113	0.9750	0.9400	1.0114
ebi-a-GCST006685	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	long sleep duration	MR Egger	28	-0.0616	0.4269	0.8863	-0.8983	0.7750	0.9402	0.4073	2.1706
ebi-a-GCST006685	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	long sleep duration	Weighted median	28	-0.0424	0.3825	0.9117	-0.7921	0.7073	0.9585	0.4529	2.0285
ebi-a-GCST006685	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	long sleep duration	Inverse variance weighted	28	-0.1958	0.3386	0.5631	-0.8594	0.4678	0.8222	0.4234	1.5965

ebi-a-GCST006685	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	long sleep duration	Simple mode	28	-1.6658	1.1838	0.1708	-3.9860	0.6543	0.1890	0.0186	1.9239
ebi-a-GCST006685	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	long sleep duration	Weighted mode	28	-0.0777	0.3615	0.8313	-0.7862	0.6307	0.9252	0.4556	1.8789
ebi-a-GCST006685	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	long sleep duration	MR Egger	28	-0.0063	0.0082	0.4496	-0.0222	0.0097	0.9938	0.9780	1.0098
ebi-a-GCST006685	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	long sleep duration	Weighted median	28	0.0054	0.0056	0.3332	-0.0056	0.0164	1.0054	0.9945	1.0165
ebi-a-GCST006685	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	long sleep duration	Inverse variance weighted	28	0.0036	0.0041	0.3777	-0.0044	0.0116	1.0036	0.9956	1.0116
ebi-a-GCST006685	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	long sleep duration	Simple mode	28	0.0106	0.0126	0.4079	-0.0141	0.0352	1.0106	0.9860	1.0358
ebi-a-GCST006685	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	long sleep duration	Weighted mode	28	0.0115	0.0122	0.3540	-0.0124	0.0354	1.0116	0.9877	1.0360
ebi-a-GCST006685	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	long sleep duration	MR Egger	28	0.2350	0.6869	0.7350	-1.1113	1.5812	1.2649	0.3291	4.8610
ebi-a-GCST006685	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	long sleep duration	Weighted median	28	-0.0531	0.7116	0.9405	-1.4479	1.3417	0.9483	0.2351	3.8256

ebi-a-GCST006685	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	long sleep duration	Inverse variance weighted	28	0.0243	0.5135	0.9623	-0.9823	1.0308	1.0246	0.3745	2.8034
ebi-a-GCST006685	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	long sleep duration	Simple mode	28	-0.0903	1.7062	0.9582	-3.4345	3.2540	0.9137	0.0322	25.8929
ebi-a-GCST006685	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	long sleep duration	Weighted mode	28	-0.0903	0.6671	0.8934	-1.3978	1.2172	0.9137	0.2471	3.3778
ebi-a-GCST006685	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	long sleep duration	MR Egger	28	-0.6589	0.3216	0.0507	-1.2892	-0.0286	0.5174	0.2755	0.9718
ebi-a-GCST006685	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	long sleep duration	Weighted median	28	-0.6435	0.3693	0.0814	-1.3675	0.0804	0.5254	0.2548	1.0837
ebi-a-GCST006685	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	long sleep duration	Inverse variance weighted	28	-0.5362	0.2585	0.0380	-1.0427	-0.0296	0.5850	0.3525	0.9709
ebi-a-GCST006685	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	long sleep duration	Simple mode	28	-0.7786	0.9015	0.3954	-2.5456	0.9884	0.4590	0.0784	2.6869
ebi-a-GCST006685	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	long sleep duration	Weighted mode	28	-0.5964	0.3460	0.0962	-1.2746	0.0817	0.5508	0.2795	1.0852
ukb-b-4956	ukb-b-10903	endometriosis || id:ukb-b-10903	Morning/evening person	MR Egger	119	0.0077	0.0057	0.1829	-0.0035	0.0189	1.0077	0.9965	1.0191

ukb-b-4956	ukb-b-10903	endometriosis || id:ukb-b-10903	Morning/evening person	Weighted median	119	0.0007	0.0018	0.6933	-0.0028	0.0042	1.0007	0.9972	1.0042
ukb-b-4956	ukb-b-10903	endometriosis || id:ukb-b-10903	Morning/evening person	Inverse variance weighted	119	0.0007	0.0013	0.5928	-0.0018	0.0032	1.0007	0.9982	1.0032
ukb-b-4956	ukb-b-10903	endometriosis || id:ukb-b-10903	Morning/evening person	Simple mode	119	0.0014	0.0051	0.7800	-0.0085	0.0114	1.0014	0.9915	1.0114
ukb-b-4956	ukb-b-10903	endometriosis || id:ukb-b-10903	Morning/evening person	Weighted mode	119	0.0012	0.0046	0.7892	-0.0077	0.0101	1.0012	0.9923	1.0102
ukb-b-4956	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Morning/evening person	MR Egger	134	-0.1786	0.3827	0.6415	-0.9287	0.5715	0.8365	0.3951	1.7710
ukb-b-4956	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Morning/evening person	Weighted median	134	-0.0999	0.1801	0.5790	-0.4530	0.2531	0.9049	0.6357	1.2880
ukb-b-4956	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Morning/evening person	Inverse variance weighted	134	-0.0874	0.1245	0.4827	-0.3315	0.1567	0.9163	0.7178	1.1696
ukb-b-4956	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Morning/evening person	Simple mode	134	0.1844	0.5671	0.7456	-0.9271	1.2958	1.2024	0.3957	3.6539
ukb-b-4956	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Morning/evening person	Weighted mode	134	0.4124	0.4889	0.4004	-0.5457	1.3706	1.5105	0.5794	3.9378
ukb-b-4956	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Morning/evening person	MR Egger	136	0.0002	0.0026	0.9261	-0.0049	0.0054	1.0002	0.9951	1.0054

ukb-b-4956	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Morning/evening person	Weighted median	136	-0.0003	0.0013	0.7939	-0.0029	0.0022	0.9997	0.9971	1.0022
ukb-b-4956	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Morning/evening person	Inverse variance weighted	136	0.0006	0.0009	0.4725	-0.0011	0.0023	1.0006	0.9989	1.0023
ukb-b-4956	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Morning/evening person	Simple mode	136	-0.0022	0.0034	0.5212	-0.0089	0.0045	0.9978	0.9911	1.0045
ukb-b-4956	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Morning/evening person	Weighted mode	136	-0.0012	0.0029	0.6794	-0.0068	0.0044	0.9988	0.9933	1.0044
ukb-b-4956	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Morning/evening person	MR Egger	135	0.0485	0.4865	0.9207	-0.9051	1.0021	1.0497	0.4045	2.7241
ukb-b-4956	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Morning/evening person	Weighted median	135	0.1576	0.2332	0.4991	-0.2994	0.6147	1.1707	0.7413	1.8490
ukb-b-4956	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Morning/evening person	Inverse variance weighted	135	0.1075	0.1621	0.5074	-0.2103	0.4253	1.1135	0.8103	1.5300
ukb-b-4956	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Morning/evening person	Simple mode	135	-0.4497	0.6765	0.5074	-1.7757	0.8763	0.6378	0.1694	2.4020
ukb-b-4956	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Morning/evening person	Weighted mode	135	0.6166	0.6478	0.3429	-0.6531	1.8862	1.8525	0.5205	6.5940

ukb-b-4956	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Morning/evening person	MR Egger	134	0.0944	0.2980	0.7519	-0.4897	0.6785	1.0990	0.6128	1.9709
ukb-b-4956	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Morning/evening person	Weighted median	134	0.2452	0.1466	0.0943	-0.0421	0.5324	1.2778	0.9588	1.7031
ukb-b-4956	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Morning/evening person	Inverse variance weighted	134	0.2401	0.0974	0.0137	0.0492	0.4311	1.2714	1.0504	1.5389
ukb-b-4956	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Morning/evening person	Simple mode	134	-0.1531	0.3918	0.6966	-0.9210	0.6148	0.8580	0.3981	1.8493
ukb-b-4956	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Morning/evening person	Weighted mode	134	0.1875	0.3330	0.5744	-0.4653	0.8402	1.2062	0.6280	2.3169
ukb-b-4616	ukb-b-10903	endometriosis || id:ukb-b-10903	Nap during day	MR Egger	81	0.0052	0.0083	0.5330	-0.0111	0.0216	1.0052	0.9889	1.0218
ukb-b-4616	ukb-b-10903	endometriosis || id:ukb-b-10903	Nap during day	Weighted median	81	0.0053	0.0037	0.1591	-0.0021	0.0126	1.0053	0.9979	1.0126
ukb-b-4616	ukb-b-10903	endometriosis || id:ukb-b-10903	Nap during day	Inverse variance weighted	81	0.0006	0.0024	0.8131	-0.0042	0.0054	1.0006	0.9958	1.0054
ukb-b-4616	ukb-b-10903	endometriosis || id:ukb-b-10903	Nap during day	Simple mode	81	0.0099	0.0087	0.2591	-0.0072	0.0271	1.0100	0.9928	1.0274
ukb-b-4616	ukb-b-10903	endometriosis || id:ukb-b-10903	Nap during day	Weighted mode	81	0.0087	0.0080	0.2795	-0.0070	0.0245	1.0088	0.9930	1.0248

ukb-b-4616	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Nap during day	MR Egger	83	-0.2182	0.9018	0.8094	-1.9857	1.5492	0.8039	0.1373	4.7078
ukb-b-4616	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Nap during day	Weighted median	83	0.1679	0.3953	0.6712	-0.6070	0.9427	1.1828	0.5450	2.5670
ukb-b-4616	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Nap during day	Inverse variance weighted	83	0.2319	0.2554	0.3638	-0.2687	0.7326	1.2611	0.7644	2.0804
ukb-b-4616	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Nap during day	Simple mode	83	-0.0913	1.0170	0.9287	-2.0847	1.9021	0.9127	0.1243	6.6999
ukb-b-4616	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Nap during day	Weighted mode	83	-0.0214	0.9031	0.9812	-1.7915	1.7487	0.9788	0.1667	5.7471
ukb-b-4616	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Nap during day	MR Egger	85	0.0101	0.0060	0.0963	-0.0017	0.0219	1.0102	0.9983	1.0221
ukb-b-4616	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Nap during day	Weighted median	85	0.0062	0.0028	0.0283	0.0007	0.0118	1.0062	1.0007	1.0119
ukb-b-4616	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Nap during day	Inverse variance weighted	85	0.0060	0.0018	0.0008	0.0025	0.0095	1.0060	1.0025	1.0096
ukb-b-4616	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Nap during day	Simple mode	85	0.0018	0.0059	0.7650	-0.0099	0.0134	1.0018	0.9902	1.0135

ukb-b-4616	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Nap during day	Weighted mode	85	0.0083	0.0046	0.0736	-0.0007	0.0173	1.0083	0.9993	1.0174
ukb-b-4616	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Nap during day	MR Egger	84	-1.2672	1.1357	0.2678	-3.4931	0.9588	0.2816	0.0304	2.6086
ukb-b-4616	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Nap during day	Weighted median	84	-0.3801	0.5004	0.4475	-1.3609	0.6006	0.6838	0.2564	1.8233
ukb-b-4616	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Nap during day	Inverse variance weighted	84	-0.1001	0.3328	0.7637	-0.7524	0.5523	0.9048	0.4712	1.7372
ukb-b-4616	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Nap during day	Simple mode	84	0.2395	1.1590	0.8368	-2.0321	2.5111	1.2706	0.1311	12.3185
ukb-b-4616	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Nap during day	Weighted mode	84	-0.3675	0.9101	0.6874	-2.1512	1.4162	0.6925	0.1163	4.1216
ukb-b-4616	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Nap during day	MR Egger	83	-0.6224	0.7825	0.4287	-2.1561	0.9113	0.5367	0.1158	2.4875
ukb-b-4616	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Nap during day	Weighted median	83	-0.4785	0.3094	0.1220	-1.0850	0.1279	0.6197	0.3379	1.1365
ukb-b-4616	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Nap during day	Inverse variance weighted	83	-0.3027	0.2214	0.1717	-0.7367	0.1313	0.7388	0.4787	1.1404

ukb-b-4616	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Nap during day	Simple mode	83	-0.6560	0.8531	0.4441	-2.3281	1.0161	0.5189	0.0975	2.7624
ukb-b-4616	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Nap during day	Weighted mode	83	-0.7506	0.7397	0.3132	-2.2005	0.6992	0.4721	0.1107	2.0122
ebi-a-GCST006686	ukb-b-10903	endometriosis || id:ukb-b-10903	short sleep duration	MR Egger	12	0.0051	0.0337	0.8832	-0.0610	0.0712	1.0051	0.9408	1.0738
ebi-a-GCST006686	ukb-b-10903	endometriosis || id:ukb-b-10903	short sleep duration	Weighted median	12	-0.0051	0.0078	0.5172	-0.0204	0.0102	0.9950	0.9799	1.0103
ebi-a-GCST006686	ukb-b-10903	endometriosis || id:ukb-b-10903	short sleep duration	Inverse variance weighted	12	-0.0022	0.0062	0.7283	-0.0144	0.0101	0.9978	0.9857	1.0101
ebi-a-GCST006686	ukb-b-10903	endometriosis || id:ukb-b-10903	short sleep duration	Simple mode	12	-0.0105	0.0139	0.4661	-0.0378	0.0168	0.9895	0.9629	1.0169
ebi-a-GCST006686	ukb-b-10903	endometriosis || id:ukb-b-10903	short sleep duration	Weighted mode	12	-0.0095	0.0132	0.4852	-0.0353	0.0163	0.9905	0.9653	1.0164
ebi-a-GCST006686	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	short sleep duration	MR Egger	23	0.0915	0.8014	0.9102	-1.4793	1.6622	1.0958	0.2278	5.2710
ebi-a-GCST006686	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	short sleep duration	Weighted median	23	0.0707	0.6195	0.9091	-1.1436	1.2850	1.0733	0.3187	3.6148
ebi-a-GCST006686	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	short sleep duration	Inverse variance weighted	23	-0.0280	0.4115	0.9458	-0.8346	0.7786	0.9724	0.4340	2.1785

ebi-a-GCST006686	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	short sleep duration	Simple mode	23	-0.5468	1.0611	0.6115	-2.6265	1.5329	0.5788	0.0723	4.6317
ebi-a-GCST006686	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	short sleep duration	Weighted mode	23	0.3980	0.7826	0.6161	-1.1359	1.9319	1.4889	0.3211	6.9027
ebi-a-GCST006686	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	short sleep duration	MR Egger	23	0.0106	0.0096	0.2834	-0.0083	0.0295	1.0107	0.9918	1.0300
ebi-a-GCST006686	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	short sleep duration	Weighted median	23	-0.0015	0.0051	0.7733	-0.0115	0.0086	0.9985	0.9885	1.0086
ebi-a-GCST006686	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	short sleep duration	Inverse variance weighted	23	0.0008	0.0043	0.8522	-0.0077	0.0093	1.0008	0.9923	1.0093
ebi-a-GCST006686	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	short sleep duration	Simple mode	23	-0.0023	0.0098	0.8194	-0.0215	0.0170	0.9977	0.9787	1.0171
ebi-a-GCST006686	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	short sleep duration	Weighted mode	23	-0.0023	0.0093	0.8098	-0.0205	0.0160	0.9977	0.9797	1.0161
ebi-a-GCST006686	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	short sleep duration	MR Egger	24	-0.1511	1.3718	0.9133	-2.8399	2.5377	0.8597	0.0584	12.6505
ebi-a-GCST006686	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	short sleep duration	Weighted median	24	-0.5365	0.8213	0.5136	-2.1462	1.0732	0.5848	0.1169	2.9248

ebi-a-GCST006686	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	short sleep duration	Inverse variance weighted	24	-0.5171	0.6584	0.4322	-1.8077	0.7734	0.5962	0.1640	2.1671
ebi-a-GCST006686	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	short sleep duration	Simple mode	24	-0.3799	1.5534	0.8090	-3.4245	2.6648	0.6840	0.0326	14.3646
ebi-a-GCST006686	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	short sleep duration	Weighted mode	24	-0.0954	1.2109	0.9379	-2.4688	2.2780	0.9090	0.0847	9.7572
ebi-a-GCST006686	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	short sleep duration	MR Egger	23	0.7086	0.6759	0.3063	-0.6161	2.0334	2.0312	0.5401	7.6397
ebi-a-GCST006686	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	short sleep duration	Weighted median	23	0.7106	0.5387	0.1871	-0.3453	1.7665	2.0352	0.7080	5.8502
ebi-a-GCST006686	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	short sleep duration	Inverse variance weighted	23	0.3191	0.3471	0.3579	-0.3612	0.9994	1.3759	0.6968	2.7168
ebi-a-GCST006686	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	short sleep duration	Simple mode	23	1.6250	1.0266	0.1277	-0.3870	3.6371	5.0786	0.6791	37.9810
ebi-a-GCST006686	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	short sleep duration	Weighted mode	23	1.2079	0.7331	0.1136	-0.2290	2.6448	3.3465	0.7953	14.0812
ukb-b-4424	ukb-b-10903	endometriosis || id:ukb-b-10903	Sleep duration	MR Egger	52	-0.0109	0.0113	0.3428	-0.0331	0.0114	0.9892	0.9674	1.0114

ukb-b-4424	ukb-b-10903	endometriosis || id:ukb-b-10903	Sleep duration	Weighted median	52	-0.0008	0.0037	0.8330	-0.0080	0.0065	0.9992	0.9920	1.0065
ukb-b-4424	ukb-b-10903	endometriosis || id:ukb-b-10903	Sleep duration	Inverse variance weighted	52	0.0025	0.0026	0.3405	-0.0026	0.0076	1.0025	0.9974	1.0076
ukb-b-4424	ukb-b-10903	endometriosis || id:ukb-b-10903	Sleep duration	Simple mode	52	-0.0009	0.0090	0.9193	-0.0187	0.0168	0.9991	0.9815	1.0170
ukb-b-4424	ukb-b-10903	endometriosis || id:ukb-b-10903	Sleep duration	Weighted mode	52	-0.0041	0.0072	0.5716	-0.0181	0.0100	0.9959	0.9820	1.0100
ukb-b-4424	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Sleep duration	MR Egger	58	-0.6366	1.0234	0.5365	-2.6424	1.3693	0.5291	0.0712	3.9324
ukb-b-4424	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Sleep duration	Weighted median	58	-0.1682	0.3993	0.6735	-0.9509	0.6144	0.8452	0.3864	1.8486
ukb-b-4424	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Sleep duration	Inverse variance weighted	58	-0.1992	0.2704	0.4614	-0.7292	0.3308	0.8194	0.4823	1.3921
ukb-b-4424	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Sleep duration	Simple mode	58	0.2385	0.8540	0.7810	-1.4353	1.9123	1.2693	0.2380	6.7687
ukb-b-4424	finn-b-N14_FEMALEINFERT	Female infertility || id:finn-b-N14_FEMALEINFERT	Sleep duration	Weighted mode	58	-0.0547	0.6901	0.9371	-1.4074	1.2979	0.9467	0.2448	3.6618
ukb-b-4424	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Sleep duration	MR Egger	58	0.0030	0.0065	0.6505	-0.0098	0.0157	1.0030	0.9903	1.0158

ukb-b-4424	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Sleep duration	Weighted median	58	0.0005	0.0027	0.8472	-0.0048	0.0058	1.0005	0.9952	1.0059
ukb-b-4424	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Sleep duration	Inverse variance weighted	58	-0.0018	0.0018	0.3011	-0.0053	0.0016	0.9982	0.9947	1.0016
ukb-b-4424	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Sleep duration	Simple mode	58	-0.0005	0.0062	0.9396	-0.0125	0.0116	0.9995	0.9875	1.0117
ukb-b-4424	ukb-d-N94	abnormal uterine bleeding || id:ukb-d-N94	Sleep duration	Weighted mode	58	0.0012	0.0048	0.8023	-0.0082	0.0106	1.0012	0.9918	1.0107
ukb-b-4424	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Sleep duration	MR Egger	58	-1.5316	1.1944	0.2050	-3.8726	0.8093	0.2162	0.0208	2.2464
ukb-b-4424	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Sleep duration	Weighted median	58	-0.6102	0.5092	0.2307	-1.6082	0.3877	0.5432	0.2003	1.4736
ukb-b-4424	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Sleep duration	Inverse variance weighted	58	-0.1803	0.3297	0.5845	-0.8264	0.4659	0.8350	0.4376	1.5934
ukb-b-4424	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Sleep duration	Simple mode	58	1.9781	1.2175	0.1097	-0.4082	4.3644	7.2288	0.6648	78.6028
ukb-b-4424	ebi-a-GCST90044902	Polycystic ovary syndrome (adjusted for age) || id:ebi-a-GCST90044902	Sleep duration	Weighted mode	58	-1.2026	0.8178	0.1469	-2.8055	0.4003	0.3004	0.0605	1.4923

ukb-b-4424	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Sleep duration	MR Egger	58	0.3593	0.8137	0.6605	-1.2356	1.9542	1.4323	0.2907	7.0581
ukb-b-4424	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Sleep duration	Weighted median	58	0.0490	0.3146	0.8764	-0.5677	0.6656	1.0502	0.5668	1.9456
ukb-b-4424	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Sleep duration	Inverse variance weighted	58	-0.0824	0.2149	0.7014	-0.5037	0.3389	0.9209	0.6043	1.4034
ukb-b-4424	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Sleep duration	Simple mode	58	0.1727	0.6944	0.8044	-1.1882	1.5337	1.1885	0.3048	4.6353
ukb-b-4424	finn-b-O15_ABORT_SPONTAN	Spontaneous abortion || id:finn-b-O15_ABORT_SPONTAN	Sleep duration	Weighted mode	58	0.3078	0.5667	0.5891	-0.8029	1.4185	1.3604	0.4480	4.1308

Note: **GWAS**, Genome-Wide Association Study. **MR,** Mendelian Randomization. **SNPs**, Single Nucleotide Polymorphisms.