

Working behaviors and the risk of sensorineural hearing loss: A large cohort study¹

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1. Supplementary material
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Table S1 Diagnosis of ear diseases for exclusion.

Otitis externa	ICD10 H60
Other disorders of external ear	ICD10 H61
Perichondritis of external ear	ICD10 H61.0
Impacted cerumen	ICD10 H61.2
Acquired stenosis of external ear canal	ICD10 H61.3
Other specified disorders of external ear	ICD10 H61.8
Disorder of external ear, unspecified	ICD10 H61.9
Disorders of external ear in diseases classified elsewhere	ICD10 H62
Otitis media	ICD10 H65 ICD10 H66 ICD10 H67
Otalgia and effusion of ear	ICD10 H92
Eustachian salpingitis and obstruction	ICD10 H68
Other disorders of eustachian tube	ICD10 H69
Cholesteatoma of middle ear	ICD10 H71
Mastoiditis and related conditions	ICD10 H70
Perforation of tympanic membrane	ICD10 H72
Other disorders of tympanic membrane	ICD10 H73
Other disorders of middle ear and mastoid	ICD10 H73
Other disorders of middle ear and mastoid in diseases classified elsewhere	ICD10 H75
Otosclerosis	ICD10 H80
Disorders of vestibular function	ICD10 H81
Vertiginous syndromes in diseases classified elsewhere	ICD10 H82
Other diseases of inner ear	ICD10 H83
Other disorders of ear, not elsewhere classified	ICD10 H93
Other disorders of ear in diseases classified elsewhere	ICD10 H94
Postprocedural disorders of ear and mastoid process, not elsewhere classified	ICD10 H95
Conductive hearing loss, bilateral	ICD10 H90.0
Conductive hearing loss, unilateral with unrestricted hearing on the contralateral side	ICD10 H90.1
Conductive hearing loss, unspecified	ICD10 H90.2
Mixed conductive and sensorineural hearing loss, bilateral	ICD10 H90.6
Mixed conductive and sensorineural hearing loss, unilateral with unrestricted hearing on the contralateral side	ICD10 H90.7

Mixed conductive and sensorineural hearing loss, unspecified	ICD10 H90.8
Ototoxic hearing loss	ICD10 H91.0
Congenital malformations of ear causing impairment of hearing	Q16
Disorders of external ear	380
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Mastoiditis and related conditions	383
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Otosclerosis	387
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Table S2 Individual significant SNHL SNP. SNHL: Sensorineural hearing Loss.

SNP	CHR	POS	Beta	SE	P-value	EA	NEA
rs35096827	3	150616348	0.2345	0.0494	2.05E-06	T	C
rs12110409	6	25161761	-0.1568	0.0331	2.13E-06	C	T
rs111692650	7	97183665	0.2666	0.052	2.88E-07	T	C
rs112963117	7	16897907	0.6717	0.1177	1.16E-08	T	C
rs28369763	9	97367392	-0.376	0.078	1.43E-06	T	C
rs118000080	9	8590597	0.8979	0.1957	4.48E-06	C	T
rs12801002	11	67968159	3.606	0.7586	2.00E-06	C	T
rs887306	12	4696801	-0.144	0.0313	4.27E-06	A	G
rs111602397	14	38104327	0.4982	0.1072	3.34E-06	A	T
rs59925400	15	90061400	0.1234	0.0261	2.31E-06	T	C
rs16954293	16	55144195	-0.2613	0.0571	4.71E-06	A	G
rs72828360	16	82520226	0.4276	0.0931	4.39E-06	A	G
rs118079176	18	50571586	0.249	0.0507	9.02E-07	T	C
rs12953985	18	19790078	0.1289	0.0272	2.21E-06	A	G
rs13058269	22	48530074	0.2813	0.06	2.78E-06	G	T
rs587620443	1	144023991	-0.2945	0.0621	2.12E-06	C	G
rs6732760	2	11101112	-0.0621	0.0129	1.60E-06	G	A
rs10528	2	54889149	0.1062	0.0186	1.16E-08	C	T
rs143848409	3	116193370	0.2055	0.0414	6.97E-07	T	C
rs62401780	5	143755933	0.1652	0.0357	3.69E-06	A	G
rs4704097	5	73069581	0.0704	0.0127	2.98E-08	G	A
rs151244510	6	74134014	0.1377	0.0281	9.19E-07	A	G

rs112266013	6	15230743	0.0875	0.0189	3.55E-06	A	G
rs115596275	6	32420218	0.21	0.0221	1.73E-21	C	G
rs9493627	6	133789728	0.0735	0.0145	4.22E-07	A	G
rs3131621	6	31425499	0.0699	0.0141	7.10E-07	G	A
rs276695	6	76469115	0.0832	0.0144	8.01E-09	C	T
rs1365889	7	33992983	0.1113	0.0197	1.70E-08	T	C
rs4286873	7	103015677	0.1094	0.0223	9.23E-07	A	G
rs7826175	8	74259289	-0.0659	0.0129	3.53E-07	A	G
rs525817	8	103993578	-0.0645	0.0128	4.86E-07	C	T
rs4837295	9	131470972	0.1156	0.0216	8.37E-08	G	A
rs10901863	10	126812270	0.1002	0.014	7.79E-13	T	C
rs189961447	11	104289943	0.2014	0.0382	1.36E-07	A	T
rs61889475	11	22854789	-0.0696	0.0126	3.67E-08	G	T
rs77751702	13	20751053	0.1715	0.0344	6.05E-07	T	C
rs34876558	14	100597169	0.1498	0.0321	2.95E-06	A	G
rs55737225	15	89251311	-0.0717	0.0142	4.46E-07	T	C
rs188029302	15	35969508	0.8708	0.1694	2.75E-07	A	G
rs12591997	15	51681073	0.1332	0.0263	4.09E-07	A	C
rs60142697	16	57678900	0.0641	0.0139	3.87E-06	G	A
rs78421216	16	25509854	0.194	0.0413	2.65E-06	T	A
rs8090563	18	6678715	0.0736	0.0127	7.07E-09	A	T
rs2392794	19	472149	-0.0934	0.0163	1.07E-08	T	C
rs143450113	19	42714797	0.1552	0.0333	3.10E-06	T	C
rs146891756	20	1819541	-0.2576	0.0524	8.71E-07	T	C
rs1970546	20	59853938	-0.0642	0.0135	2.10E-06	G	A
rs6000881	22	38154544	0.0856	0.0129	3.05E-11	A	G

Table S3 Clinical and demographic characteristics of all study subjects. (prospective study) SNHL: Sensorineural hearing Loss

Variable	Never (n=49682)	Only day shift (n=4682)	Infrequent (n=2974)	Frequent (n=2152)	All participants	P-value
Any SNHL (the worst ear SRT>-3.5)						0.0936
No	5947(82.3)	411(79.8)	280(81.4)	199(77.1)	6837(82)	
Yes	1277(17.7)	104(20.2)	64(18.6)	59(22.9)	1504(18)	
Missing	42458	4167	2630	1894	51149	
Bilateral SNHL (the best ear SRT>-3.5)						0.5231
No	7043(97.5)	500(97.1)	334(97.1)	248(96.1)	8125(97.4)	
Yes	181(2.5)	15(2.9)	10(2.9)	10(3.9)	216(2.6)	
Missing	42458	4167	2630	1894	51149	
Sex						<0.001
Female	26769(53.9)	2479(52.9)	1073(36.1)	808(37.5)	31129(52.3)	
Male	22913(46.1)	2203(47.1)	1901(63.9)	1344(62.5)	28361(47.7)	
Age						<0.001
Mean(SD)	52.3(7.1)	51.7(7)	50.5(6.6)	50.4(6.5)	52.1(7.1)	
Median[Min,Max]	52[39, 70]	51[40, 70]	50[40, 69]	50[40, 70]	52[39, 70]	
Body mass index						<0.001
Under or acceptable weight	17876(36.1)	1467(31.5)	776(26.3)	530(24.7)	20649(34.9)	
Obesity	10945(22.1)	1222(26.2)	874(29.6)	654(30.5)	13695(23.1)	
Overweight	20657(41.7)	1971(42.3)	1305(44.2)	961(44.8)	24894(42)	
Missing	204	22	19	7	252	
Ethnicity						<0.001
Non-white	2870(5.8)	463(9.9)	324(10.9)	239(11.2)	3896(6.6)	
White	46675(94.2)	4195(90.1)	2640(89.1)	1901(88.8)	55411(93.4)	
Missing	137	24	10	12	183	
Townsend deprivation index						<0.001
Mean(SD)	-1.4(2.7)	-0.6(3)	-0.7(3)	-0.6(3.1)	-1.3(2.8)	
Median [Min, Max]	-1.9[-6.3, 9.9]	-1.2[-6.2, 8.9]	-1.4[-6.3, 9.1]	-1.2[-6.3, 8.7]	-1.8[-6.3, 9.9]	
Missing	83	8	6	7	104	
Qualifications						<0.001
College or University degree	21685(43.8)	1243(26.7)	744(25.2)	347(16.2)	24019(40.6)	
Other	27794(56.2)	3407(73.3)	2209(74.8)	1790(83.8)	35200(59.4)	
Missing	203	32	21	15	271	
Smoking status						<0.001

Never	29259(59)	2587(55.4)	1580(53.3)	1110(51.8)	34536(58.2)	
Current	4538(9.2)	641(13.7)	479(16.1)	379(17.7)	6037(10.2)	
Previous	15797(31.9)	1439(30.8)	908(30.6)	654(30.5)	18798(31.7)	
Missing	88	15	7	9	119	
Alcohol status						<0.001
Never	1342(2.7)	172(3.7)	113(3.8)	95(4.4)	1722(2.9)	
Current	47071(94.8)	4337(92.7)	2760(92.9)	1970(91.5)	56138(94.4)	
Previous	1245(2.5)	170(3.6)	99(3.3)	87(4)	1601(2.7)	
Missing	24	3	2	0	29	
Coffee intake						<0.001
Mean(SD)	2(2)	2.1(2.3)	2.2(2.4)	2.3(2.5)	2.1(2.1)	
Median [Min, Max]	2[0, 42]	1[0, 36]	2[0, 30]	2[0, 21]	2[0, 42]	
Missing	35	17	12	10	74	
Tea intake						<0.001
Mean (SD)	3.3(2.7)	3.5(3.2)	3.6(3.1)	3.8(3.4)	3.3(2.8)	
Median [Min, Max]	3[0, 42]	3[0, 50]	3[0, 35]	3[0, 40]	3[0, 50]	
Missing	40	12	9	9	70	
Total Metabolic Equivalent Task (MET) minutes						<0.001
Mean (SD)	2475.5(2580.8)	3300.4(3237.4)	3521.4(3289.4)	3649.3(3331.2)	2635.2(2731.6)	
Median [Min, Max]	1653[0, 19278]	2180.8[0, 19278]	2462[0, 19278]	2697.2[0, 19278]	1740[0, 19278]	
Ototoxic medication						<0.001
No	38516(77.5)	3487(74.5)	2233(75.1)	1633(75.9)	45869(77.1)	
Yes	11166(22.5)	1195(25.5)	741(24.9)	519(24.1)	13621(22.9)	
Sleep duration						<0.001
7-8	35249(71.1)	3017(64.7)	1781(60.1)	1189(55.8)	41236(69.5)	
<7	12382(25)	1406(30.2)	1032(34.8)	812(38.1)	15632(26.3)	
>8	1974(4)	237(5.1)	152(5.1)	129(6.1)	2492(4.2)	
Missing	77	22	9	22	130	
Sleeplessness						0.0018
Never/rarely	13947(28.1)	1188(25.4)	820(27.6)	597(27.8)	16552(27.8)	
Sometimes	23549(47.4)	2260(48.3)	1453(48.9)	1005(46.9)	28267(47.5)	
Usually	12174(24.5)	1234(26.4)	700(23.5)	542(25.3)	14650(24.6)	
Missing	12	0	1	8	21	
Noisy workplace						<0.001

No	40401(81.9)	3328(71.9)	1782(60.8)	1194(56.4)	46705(79.1)	
<1 year	3019(6.1)	291(6.3)	274(9.3)	132(6.2)	3716(6.3)	
>5 year	3612(7.3)	656(14.2)	623(21.2)	581(27.4)	5472(9.3)	
1-5 year	2320(4.7)	356(7.7)	253(8.6)	211(10)	3140(5.3)	
Missing	330	51	42	34	457	
Depression						0.0047
No	49437(99.5)	4641(99.1)	2962(99.6)	2140(99.4)	59180(99.5)	
Yes	245(0.5)	41(0.9)	12(0.4)	12(0.6)	310(0.5)	
Bipolar disorder						0.5222
No	49644(99.9)	4677(99.9)	2973(100)	2152(100)	59446(99.9)	
Yes	38(0.1)	5(0.1)	1(0)	0(0)	44(0.1)	
Anxiety						0.8011
No	49566(99.8)	4674(99.8)	2966(99.7)	2148(99.8)	59354(99.8)	
Yes	116(0.2)	8(0.2)	8(0.3)	4(0.2)	136(0.2)	
Vascular/heart problems						<0.001
No	39251(79.1)	3616(77.3)	2274(76.6)	1683(78.3)	46824(78.8)	
Yes	10390(20.9)	1060(22.7)	696(23.4)	466(21.7)	12612(21.2)	
Missing	41	6	4	3	54	
Diabetes						<0.001
No	48030(96.8)	4465(95.7)	2842(95.8)	2052(95.7)	57389(96.6)	
Yes	1590(3.2)	202(4.3)	125(4.2)	92(4.3)	2009(3.4)	
Missing	62	15	7	8	92	
Allergic/thrombus problems						0.0011
No	32715(65.9)	3108(66.4)	1992(67.1)	1500(69.9)	39315(66.1)	
Yes	16935(34.1)	1571(33.6)	978(32.9)	647(30.1)	20131(33.9)	
Missing	32	3	4	5	44	
Cancer						0.0107
No	46798(94.4)	4418(94.7)	2838(95.6)	2043(95.4)	56097(94.5)	
Yes	2784(5.6)	247(5.3)	132(4.4)	99(4.6)	3262(5.5)	
Missing	100	17	4	10	131	

Table S4 Multivariable analysis for shift work, night shift work, physically demanding work associated with Unilateral and Bilateral SNHL. SNHL: Sensorineural hearing Loss.

Variable	Unilateral SNHL				Bilateral SNHL			
	N	Event	OR (95% CI)	P-value	N	Event	OR (95% CI)	P-value
Shift work								
Never	66306	17989	Reference		53928	5611	Reference	
Infrequent	5745	1699	1.1 (1.03-1.16)	0.003	4689	643	1.23 (1.12-1.35)	<0.001
Frequent	7610	2324	1.12 (1.06-1.18)	<0.001	6283	997	1.35 (1.25-1.47)	<0.001
Night shift work								
Never	66306	17989	Reference		53928	5611	Reference	
Only day shift	6432	1971	1.12 (1.05-1.18)	<0.001	5270	809	1.32 (1.21-1.44)	<0.001
Infrequent	3992	1151	1.07 (0.99-1.15)	0.082	1783	231	1.16 (1-1.35)	0.047
Frequent	2918	896	1.14 (1.05-1.24)	0.002	3909	598	1.33 (1.2-1.47)	<0.001
Physically demanding work								
Never	29783	7477	Reference		24327	2021	Reference	
Sometimes	24316	6666	1.08 (1.04-1.12)	<0.001	19814	2164	1.22 (1.14-1.3)	<0.001
Usually	11355	3308	1.15 (1.09-1.21)	<0.001	9223	1176	1.35 (1.25-1.47)	<0.001
Always	14173	4543	1.29 (1.22-1.35)	<0.001	11511	1881	1.72 (1.59-1.86)	<0.001

Adjusted for age, sex, BMI, Townsend deprivation index, years of education and ethnic background, smoking status, alcohol drinker status, coffee intake, tea intake, regular physical activity, ototoxic medication intake, years of exposure to noisy work environments, sleep duration, sleeplessness status and pre-existing comorbidities.

Table S5 Multivariable analysis for shift work, night shift work, physically demanding work associated with Bilateral SNHL compared with Unilateral SNHL. SNHL: Sensorineural hearing Loss.

Variable	N	Event	OR (95% CI)	P-value
Shift work				
Never	23600	5611	Reference	
Infrequent	2342	643	1.15 (1.04-1.26)	0.007
Frequent	3321	997	1.19 (1.09-1.29)	<0.001
Night shift work				
Never	23600	5611	Reference	
Only day shift	2780	809	1.19 (1.09-1.31)	<0.001
Infrequent	1616	465	1.17 (1.04-1.31)	0.009
Frequent	1260	364	1.12 (0.98-1.28)	0.093
Physically demanding work				
Never	9498	2021	Reference	
Sometimes	8830	2164	1.11 (1.03-1.19)	0.004
Usually	4484	1176	1.18 (1.08-1.28)	<0.001
Always	6424	1881	1.29 (1.19-1.4)	<0.001

Adjusted for age, sex, BMI, Townsend deprivation index, years of education and ethnic background, smoking status, alcohol drinker status, coffee intake, tea intake, regular physical activity, ototoxic medication intake, years of exposure to noisy work environments, sleep duration, sleeplessness status and pre-existing comorbidities.

Table S6 Multivariable analysis for shift work, night shift work, physically demanding work associated with Mild and Severe SNHL. SNHL: Sensorineural hearing Loss.

Variable	Mild SNHL				Severe SNHL			
	N	Event	OR (95% CI)	P-value	N	Event	OR (95% CI)	P-value
Shift work								
Never	66743	18426	Reference		52994	4677	Reference	
Infrequent	7661	2375	1.11 (1.05-1.17)	<0.001	6145	859	1.4 (1.28-1.52)	<0.001
Frequent	5781	1735	1.09 (1.03-1.16)	0.006	4604	558	1.28 (1.16-1.42)	<0.001
Night shift work								
Never	66743	18426	Reference		52994	4677	Reference	
Only day shift	6479	2018	1.11 (1.05-1.18)	<0.001	5152	691	1.36 (1.24-1.49)	<0.001
Infrequent	4007	1166	1.05 (0.98-1.13)	0.167	3259	418	1.35 (1.2-1.51)	<0.001
Frequent	2942	920	1.14 (1.05-1.24)	0.002	2330	308	1.32 (1.16-1.51)	<0.001
Physically demanding work								
Never	29783	7477	Reference		23970	1664	Reference	
Sometimes	24316	6666	1.08 (1.04-1.12)	<0.001	19378	1728	1.18 (1.1-1.27)	<0.001
Usually	11355	3308	1.15 (1.09-1.21)	<0.001	9058	1011	1.41 (1.3-1.54)	<0.001
Always	14173	4543	1.29 (1.22-1.35)	<0.001	11314	1684	1.84 (1.69-2)	<0.001

Adjusted for age, sex, BMI, Townsend deprivation index, years of education and ethnic background, smoking status, alcohol drinker status, coffee intake, tea intake, regular physical activity, ototoxic medication intake, years of exposure to noisy work environments, sleep duration, sleeplessness status and pre-existing comorbidities.

Table S7 Multivariable analysis for shift work, night shift work, physically demanding work associated with Severe SNHL compared with Mild SNHL. SNHL: Sensorineural hearing Loss.

Variable	N	Event	OR (95% CI)	P-value
Shift work				
Never	23103	4677	Reference	
Infrequent	2293	558	1.19 (1.07-1.32)	0.001
Frequent	3234	859	1.22 (1.12-1.34)	<0.001
Night shift work				
Never	23103	4677	Reference	
Only day shift	2709	691	1.21 (1.1-1.34)	<0.001
Infrequent	1584	418	1.27 (1.12-1.43)	<0.001
Frequent	1228	308	1.12 (0.98-1.29)	0.099
Physically demanding work				
Never	9320	1664	Reference	
Sometimes	8633	1728	1.07 (0.99-1.16)	0.075
Usually	4392	1011	1.24 (1.13-1.36)	<0.001
Always	6258	1684	1.43 (1.31-1.56)	<0.001

Adjusted for age, sex, BMI, Townsend deprivation index, years of education and ethnic background, smoking status, alcohol drinker status, coffee intake, tea intake, regular physical activity, ototoxic medication intake, years of exposure to noisy work environments, sleep duration, sleeplessness status and pre-existing comorbidities.

Table S8 Association of frequency of night shift work and SNHL ORs in subgroup analyses.

Variable	Category	Night shift work	N	Event	OR (95% CI)	P-value	P-interaction
Sex	Female	Never	38888	12805	Reference		0.415
		Only day shift	3859	1489	1.2(1.12-1.29)	<0.001	
		Infrequent	1664	638	1.21(1.09-1.34)	<0.001	
		Frequent	1271	509	1.23(1.09-1.39)	<0.001	
	Male	Never	33029	10795	Reference		
		Only day shift	3382	1291	1.12(1.04-1.21)	0.003	
		Infrequent	2793	978	1.04(0.95-1.13)	0.417	
		Frequent	2011	751	1.13(1.02-1.24)	0.019	
Age	≤60	Never	58594	17439	Reference		0.427
		Only day shift	6046	2167	1.16(1.1-1.23)	<0.001	
		Infrequent	3946	1354	1.08(1.01-1.16)	0.035	
		Frequent	2895	1036	1.11(1.03-1.21)	0.01	
	>60	Never	13323	6161	Reference		
		Only day shift	1195	613	1.09(0.97-1.23)	0.151	
		Infrequent	511	262	1.03(0.86-1.24)	0.745	
		Frequent	387	224	1.26(1.02-1.56)	0.032	
Chronotype	Middle	Never	42186	13592	Reference		0.007
		Only day shift	4120	1501	1.1(1.03-1.18)	0.005	
		Infrequent	2493	884	1.09(1-1.19)	0.05	
		Frequent	1763	649	1.13(1.02-1.25)	0.024	
	Morning	Never	16861	5904	Reference		
		Only day shift	1876	830	1.36(1.23-1.51)	<0.001	
		Infrequent	1104	448	1.21(1.06-1.38)	0.005	
		Frequent	641	284	1.32(1.11-1.56)	0.001	
	Evening	Never	5921	1888	Reference		
		Only day shift	581	201	1.07(0.89-1.28)	0.49	
		Infrequent	413	121	0.9(0.72-1.14)	0.388	
		Frequent	471	185	1.27(1.03-1.56)	0.022	
Noisy work environments	No	Never	58512	18921	Reference		0.026
		Only day shift	5175	1955	1.18(1.11-1.25)	<0.001	
		Infrequent	2664	936	1.08(0.99-1.17)	0.087	
		Frequent	1874	739	1.23(1.11-1.36)	<0.001	

	<1 year	Never	4311	1352	Reference		
		Only day shift	462	182	1.34(1.09-1.65)	0.005	
		Infrequent	409	145	1.24(0.99-1.55)	0.062	
		Frequent	199	76	1.43(1.05-1.94)	0.023	
	1-5 year	Never	3429	1166	Reference		
		Only day shift	534	200	1.1(0.9-1.34)	0.363	
		Infrequent	426	181	1.44(1.16-1.79)	<0.001	
		Frequent	328	126	1.21(0.94-1.55)	0.134	
	>5 year	Never	5665	2161	Reference		
		Only day shift	1070	443	1.08(0.94-1.24)	0.308	
		Infrequent	958	354	1.01(0.87-1.17)	0.922	
		Frequent	881	319	1.01(0.86-1.18)	0.911	
Physically demanding work	No	Never	28591	8396	Reference		0.693
		Only day shift	1147	387	1.16(1.02-1.32)	0.026	
		Infrequent	628	210	1.2(1.01-1.43)	0.039	
		Frequent	398	139	1.23(0.99-1.53)	0.058	
	Yes	Never	41004	14341	Reference		
		Only day shift	5864	2299	1.13(1.06-1.2)	<0.001	
		Infrequent	3695	1348	1.05(0.98-1.13)	0.195	
		Frequent	2787	1080	1.13(1.03-1.22)	0.006	

Table S9 Association of frequency of physically demanding work and SNHL ORs in subgroup analyses.

Variable	Category	Physically demanding work	N	Event	OR (95% CI)	P-value	P-interaction
Sex	Female	Never	15683	4750	Reference		0.115
		Sometimes	12108	4103	1.12 (1.06-1.18)	<0.001	
		Usually	5669	2003	1.18 (1.1-1.26)	<0.001	
		Always	7575	3008	1.38 (1.29-1.47)	<0.001	
	Male	Never	12362	3612	Reference		
		Sometimes	11252	3691	1.1 (1.03-1.16)	0.002	
		Usually	5189	1908	1.24 (1.15-1.33)	<0.001	
		Always	6446	2607	1.39 (1.29-1.5)	<0.001	
Age	≤60	Never	23490	6403	Reference		0.788
		Sometimes	18913	5711	1.12 (1.07-1.17)	<0.001	
		Usually	8861	2916	1.24 (1.17-1.31)	<0.001	
		Always	11406	4239	1.42 (1.35-1.5)	<0.001	
	>60	Never	4555	1959	Reference		
		Sometimes	4447	2083	1.12 (1.03-1.21)	0.013	
		Usually	1997	995	1.22 (1.09-1.36)	<0.001	
		Always	2615	1376	1.3 (1.17-1.45)	<0.001	
Noisy work environments	No	Never	24701	7333	Reference		0.064
		Sometimes	18745	6256	1.12 (1.07-1.17)	<0.001	
		Usually	7700	2706	1.18 (1.11-1.25)	<0.001	
		Always	9133	3619	1.39 (1.31-1.47)	<0.001	
	< 1 year	Never	1455	422	Reference		
		Sometimes	1504	447	0.96 (0.81-1.13)	0.596	
		Usually	761	293	1.39 (1.14-1.69)	0.001	
		Always	900	353	1.37 (1.12-1.68)	0.002	
	1-5 years	Never	966	309	Reference		
		Sometimes	1827	664	1.23 (1.04-1.46)	0.018	
		Usually	1627	633	1.35 (1.13-1.61)	<0.001	
		Always	2894	1192	1.45 (1.22-1.71)	<0.001	
	>5 years	Never	923	298	Reference		
		Sometimes	1284	427	1 (0.83-1.21)	0.981	
		Usually	770	279	1.15 (0.93-1.43)	0.19	
		Always	1094	451	1.4 (1.14-1.72)	0.002	

Table S10 Multivariable analysis for shift work, night shift work, physically demanding work associated with any and Bilateral SNHL (Prospective Study). SNHL: Sensorineural hearing Loss.

Variable	Any SNHL (the worst ear SRT>-3.5)				Bilateral SNHL (the best ear SRT>-3.5)			
	N	Event	RR (95% CI)	P-value	N	Event	RR (95% CI)	P-value
Shift work								
Never	7075	1243	Reference		7075	174	Reference	
Infrequent	508	98	1.12 (0.91-1.38)	0.273	508	18	1.59 (0.97-2.6)	0.068
Frequent	584	126	1.24 (1.02-1.49)	0.029	584	17	1.27 (0.76-2.13)	0.355
Night shift work								
Never	7075	1243	Reference		7075	174	Reference	
Only day shift	507	104	1.15 (0.94-1.41)	0.176	507	15	1.21 (0.71-2.06)	0.481
Infrequent	338	64	1.12 (0.87-1.45)	0.374	338	10	1.43 (0.74-2.74)	0.284
Frequent	247	56	1.35 (1.02-1.77)	0.035	247	10	1.98 (1.02-3.83)	0.044
Physically demanding work								
Never	3561	619	Reference		3561	84	Reference	
Sometimes	2527	430	0.95 (0.84-1.08)	0.428	2527	54	0.87 (0.62-1.23)	0.428
Usually	1073	212	1.07 (0.91-1.25)	0.442	1073	31	1.18 (0.77-1.8)	0.451
Always	1002	206	1.07 (0.9-1.27)	0.454	1002	40	1.6 (1.05-2.42)	0.028

Adjusted for age, sex, BMI, Townsend deprivation index, years of education and ethnic background, smoking status, alcohol drinker status, coffee intake, tea intake, regular physical activity, ototoxic medication intake, years of exposure to noisy work environments, sleep duration, sleeplessness status and pre-existing comorbidities.

Table S11 Multivariable-adjusted ORs (95% CIs) for weighted PRS, PRS tertiles and SNHL

Polygenic risk	N	Event	OR (95% CI)	P-value
Low PRS	27803	9176	Reference	
Moderate PRS	27748	9198	1.00 (0.96-1.04)	0.984
High PRS	28620	9859	1.05 (1.02-1.09)	0.004

Table S12 Multivariable-adjusted ORs (95% CIs) for weighted PRS, PRS tertiles and night shift work

Polygenic risk	Night Shift work	N	Event	OR (95% CI)	P-value	P-interaction
Low	Never	23067	7425	Reference		0.495
	Only day shift	2273	845	1.14(1.04-1.26)	0.005	
	Infrequent	1435	515	1.18(1.05-1.32)	0.006	
	Frequent	1024	390	1.28(1.12-1.47)	<0.001	
Moderate	Never	22943	7404	Reference		
	Only day shift	2349	893	1.18(1.08-1.3)	<0.001	
	Infrequent	1407	511	1.13(1-1.27)	0.048	
	Frequent	1046	389	1.11(0.97-1.27)	0.125	
High	Never	23620	7929	Reference		
	Only day shift	2392	951	1.18(1.08-1.29)	<0.001	
	Infrequent	1485	534	1.02(0.91-1.14)	0.779	
	Frequent	1115	440	1.14(1-1.3)	0.052	

Figure S1 Association between shift work, night shift work, physically demanding work and unilateral or bilateral SNHL.

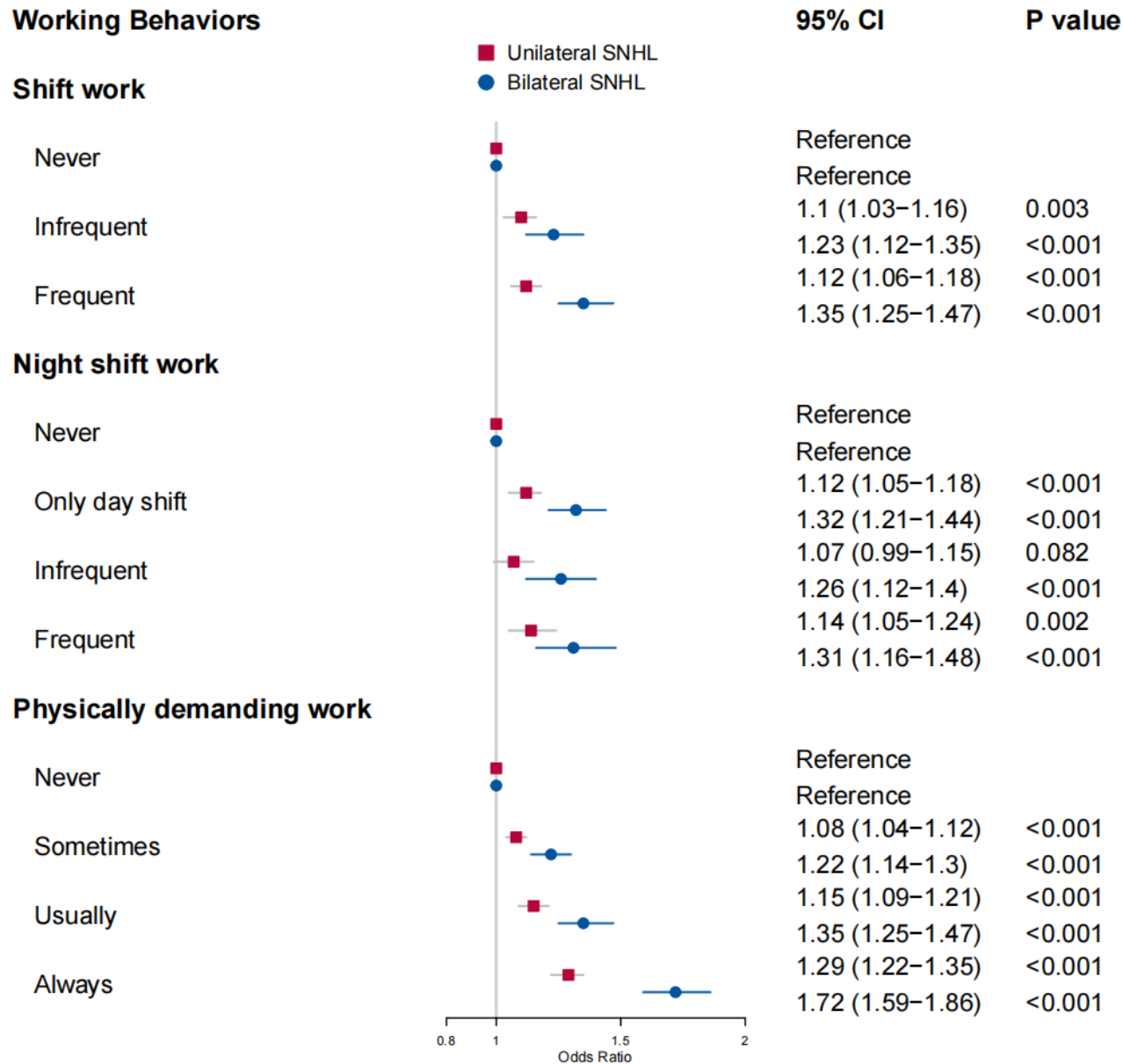


Figure S2 Association between shift work, night shift work, physically demanding work and mild or severe SNHL.

