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Occupational exposure to inhaled pollutants and risk of COPD: A large UK population-based UK Biobank cohort.

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Supplementary tables:

Table S1 Summary statistics for occupational exposure to different pollutant types

Number of pollutants (exposed to)	N (%) exposed	N (%) COPD
0	151587 (66.3)	13071 (64.4)
1	10667 (4.7)	967 (4.8)
2	22158 (9.7)	2216 (10.9)
3	18361 (8)	1826 (9)
4	14982 (6.6)	1330 (6.6)
5	10118 (4.4)	813 (4)
6	741 (0.3)	66 (0.3)

Table S2 Correlation between different pollutant types

	Vapours	Gases	Dusts	Fumes	Fibres	Mists
Vapours	1					
Gases	0.4407	1				
Dusts	0.7319	0.4838	1			
Fumes	0.1999	0.3835	0.3619	1		
Fibres	0.2743	0.0197	0.4847	0.4784	1	
Mists	0.6344	0.3977	0.5884	0.3179	0.2553	1
VGDF	0.6739	0.5851	0.8521	0.6141	0.4399	0.5408

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Table S3 Prevalence ratios (95% CI) of COPD risk defined as FEV$_1$/FVC <LLN for job duration using the lowest quartile of duration as a reference category for each pollutant; overall (n=228 614).

Pollutant	Job duration	Healthy exposed	COPD cases	Crude PR (95% CI)	Adjusted PR (95% CI)	p-trend for Adjusted PRs
Vapours		38866	3903	1.06 (1.03, 1.1)	1.03 (0.99,1.07)	
	Q2	7539	737	1.01 (0.97-1.06)	1.01 (0.97, 1.06)	0.718
	Q3	9063	884	0.99 (0.95, 1.03)	1.01 (0.97, 1.06)	
	Q4	10440	994	0.95 (0.91, 0.99)	0.99 (0.94, 1.03)	
Gases		30661	3135	1.08 (1.04, 1.12)	1.04 (0.99, 1.08)	
	Q2	6015	600	1.03 (0.99, 1.07)	1.03 (0.98,1.08)	0.423
	Q3	7178	719	1.01 (0.97,1.05)	1.03 (0.99, 1.08)	
	Q4	8183	817	0.97 (0.93, 1.01)	1.02 (0.97, 1.06)	
Dusts		55748	5745	1.09 (1.06,1.12)	1.05 (1.01, 1.08)	
	Q2	10658	1084	1.02 (0.98, 1.06)	1.01 (0.97, 1.06)	0.778
	Q3	12629	1264	0.99 (0.96,1.03)	1.01 (0.97,1.06)	
	Q4	15539	1571	0.97 (0.93,1.0)	1.0 (0.96, 1.05)	
B-dusts		29941	3093	1.09 (1.05,1.13)	1.06 (1.01, 1.10)	
	Q2	6029	603	1.03 (0.99,1.07)	1.02 (0.98, 1.07)	0.469
	Q3	6962	703	1.01 (0.97,1.05)	1.03 (0.99, 1.08)	
	Q4	7600	786	0.98 (0.94,1.02)	1.01 (0.97, 1.06)	
M-dusts		33341	3383	1.08 (1.04, 1.12)	1.03 (0.99, 1.08)	
	Q2	6056	616	1.03 (0.99,1.08)	1.02 (0.98, 1.07)	0.796
	Q3	7387	725	1.0 (0.96,1.05)	1.02 (0.97, 1.06)	
	Q4	9993	1001	0.97 (0.93, 1.01)	1.01 (0.96, 1.05)	
Fumes		33282	3399	1.08 (1.04, 1.12)	1.02 (0.98, 1.06)	
	Q2	6271	641	1.03 (0.99, 1.08)	1.03 (0.99, 1.08)	0.703
	Q3	7548	736	1.0 (0.96, 1.04)	1.02 (0.98, 1.07)	
	Q4	8968	905	0.97 (0.93,1.01)	1.01 (0.96, 1.06)	
Diesel		16902	1828	1.14 (1.08, 1.19)	1.04 (0.98, 1.09)	
	Q2	3252	368	1.04 (1.0, 1.09)	1.04 (0.99,1.09)	0.62
	Q3	3712	374	1.01 (0.97, 1.06)	1.03 (0.98, 1.07)	
	Q4	4221	453	0.98 (0.93, 1.02)	1.01 (0.96, 1.06)	
Fibres		18604	1814	1.05 (1.0, 1.10)	0.99 (0.93, 1.04)	
	Q2	3200	298	1.04 (0.99, 1.09)	1.03 (0.98, 1.08)	0.377
	Q3	4023	371	1.02 (0.97, 1.06)	1.03 (0.98, 1.08)	
	Q4	6160	652	1.0 (0.95, 1.04)	1.02 (0.97, 1.07)	
Mists		27211	2662	1.04 (1.0, 1.08)	1.01 (0.97, 1.06)	
	Q2	5420	504	1.02 (0.98, 1.07)	1.02 (0.98, 1.07)	0.943
	Q3	6167	635	1.02 (0.98, 1.06)	1.04 (0.99, 1.08)	
	Q4	7447	684	0.96 (0.92, 1.0)	0.99 (0.95, 1.04)	
VGDF		69682	7205	1.09 (1.06, 1.12)	1.04 (1.01, 1.07)	
	Q2	13350	1374	1.01 (0.98, 1.05)	1.01 (0.97, 1.05)	0.971
	Q3	15888	1584	0.99 (0.95, 1.02)	1.0 (0.97, 1.05)	
	Q4	18818	1894	0.96 (0.92, 1.0)	1.0 (0.96, 1.04)	

~ Adjusted for sex, study centre (22 categories), age (5 years categories) and lifetime smoking exposure (ever, pack-years and year since quitting) and duration of exposures for specific pollutants.
Healthy =non-COPD cases.
COPD, chronic obstructive pulmonary disease; PR, prevalence ratio
VGDF - Vapours, gases, dusts, or fumes, M-dusts -Mineral dusts, B- Dusts -Biological dusts
Q2, quartile 2; Q3, quartile 3; Q4, quartile 4

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Table S4 Prevalence ratios (95% CI) of COPD risk defined as FEV_1/FVC <LLN adjusted for co-pollutants in never smokers

Co-Pollutant	All		Never smokers
	Crude PR (95% CI)	Adjusted* PR (95% CI)	Adjusted# PR (95% CI)
Vapours	1.02 (0.98, 1.06)	1.01 (0.97, 1.05)	0.96 (0.91, 1.02)
Gases	1.05 (1.01,1.09)	1.03 (0.99, 1.08)	1.04 (0.98, 1.11)
Vapours	0.95 (0.91, 1.0)	0.96 (0.91, 1.01)	0.95 (0.98, 1.03)
Dusts	1.12 (1.07, 1.17)	1.07 (1.02, 1.12)	1.04 (0.98, 1.12)
Vapours	1.03 (1.0, 1.07)	1.02 (0.99, 1.06)	0.99 (0.94, 1.05)
Fumes	1.05 (1.02, 1.09)	1.01 (0.97, 1.05)	0.98 (0.92, 1.04)
Vapours	1.05 (1.02, 1.09)	1.03 (0.99, 1.07)	1.02 (0.97, 1.07)
Fibres	1.0 (0.95, 1.05)	0.96 (0.91, 1.01)	0.87 (0.80, 0.94)
Vapours	1.07 (1.03, 1.12)	1.04 (0.99, 1.09)	1.02 (0.96, 1.09)
Mists	0.97 (0.92, 1.02)	0.98 (0.93, 1.03)	0.94 (0.87, 1.02)
Gases	1.01 (0.97, 1.06)	1.01 (0.97, 1.06)	1.03 (0.96, 1.1)
Dusts	1.07 (1.03, 1.11)	1.04 (1.0, 1.08)	0.99 (0.94, 1.05)
Gases	1.05 (1.01, 1.1)	1.05 (1.01, 1.1)	1.05 (0.99, 1.11)
Fumes	1.06 (1.02, 1.1)	1.0 (0.95, 1.04)	0.96 (0.91, 1.03)
Gases	1.07 (1.04, 1.12)	1.05 (1.0, 1.09)	1.03 (0.98, 1.09)
Fibres	1.02 (0.97, 1.07)	0.97 (0.92, 1.02)	0.87 (0.80, 0.94)
Gases	1.07 (1.03, 1.12)	1.05 (1.0, 1.09)	1.06 (0.99, 1.12)
Mists	0.99 (0.95, 1.03)	0.98 (0.94, 1.03)	0.93 (0.87, 1.0)
Dusts	1.07 (1.03, 1.1)	1.05 (1.02, 1.08)	1.02 (0.97, 1.07)
Fumes	1.02 (0.99, 1.06)	0.98 (0.94, 1.03)	0.97 (0.91, 1.03)
Dusts	1.1 (1.07, 1.14)	1.07 (1.03, 1.11)	1.06 (1.0, 1.11)
Fibre	0.94 (0.89, 0.99)	0.92 (0.87, 0.97)	0.83 (0.76, 0.90)
Dusts	1.12 (1.08, 1.16)	1.07 (1.03, 1.11)	1.05 (0.99, 1.11)
Mists	0.93 (0.89, 0.97)	0.95 (0.9, 1.0)	0.92 (0.86, 0.99)
Fume	1.08 (1.04, 1.13)	1.03 (0.98, 1.08)	1.04 (0.97, 1.11)
Fibre	0.97 (0.92, 1.02)	0.96 (0.91, 1.02)	0.85 (0.78, 0.93)
Fume	1.07 (1.03, 1.11)	1.01 (0.97, 1.05)	0.99 (0.93, 1.06)
Mists	0.99 (0.95, 1.03)	1.0 (0.96, 1.05)	0.96 (0.90, 1.03)
Fibres	1.01 (0.96, 1.06)	0.97 (0.92, 1.02)	0.88 (0.81, 0.95)
Mists	1.02 (0.98, 1.06)	1.01 (0.97, 1.06)	0.99 (0.93, 1.05)

*adjusted for sex, study centre (22 categories), age (5 years categories) and lifetime smoking exposure (ever, pack-years and year since quitting)

#adjusted for sex, study centre (22 categories), age (5 years categories)

Reference group for each pollutant individuals in jobs with no exposure to any of the pollutants (clean group)

COPD, chronic obstructive pulmonary disease;

VGDF - Vapours, gases, dusts, or fumes

VGDFFiM – Vapours, gases, dusts, fumes, fibres, or mists

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Table S5 Prevalence ratios (95% CI) of COPD risk spirometry defined as FEV_1/FVC <LLN ever- smokers for exposure to occupational pollutants (n=203 086)

	Ever-smokers category				Correction for multiple testing				
Pollutant	**Healthy exposed**	**COPD exposed**	**PR (95% CI)**	**p-value**	**Pollutant**	**p-value**	**N**	**Holm-Bonferroni**	
Vapours	3473	876	1.23 (1.14-1.32)	1.60E-08	Dusts	3.06E-11	1	0.005	Significant
Gases	2784	674	1.22 (1.12-1.32)	1.47E-06	VGDF	3.69E-11	2	0.00555555	Significant
Dusts	5329	1328	1.24 (1.16-1.32)	3.06E-11	Fibres	5.78E-09	3	0.00625	Significant
Biological dusts	2646	676	1.23 (1.13-1.33)	2.88E-07	Vapours	1.60E-08	4	0.007142857	Significant
Mineral dusts	3361	806	1.24 (1.15-1.34)	4.99E-08	Mineral dusts	4.99E-08	5	0.008333333	Significant
Fumes	3622	831	1.22 (1.13-1.32)	6.48E-07	Biological dusts	2.88E-07	6	0.01	Significant
Diesel fume	1944	463	1.26 (1.14-1.39)	2.88E-06	Fumes	6.48E-07	7	0.0125	Significant
Fibres	1866	464	1.34 (1.21-1.47)	5.78E-09	Gases	1.47E-06	8	0.016666667	Significant
Mists	2425	578	1.17 (1.08-1.27)	0.000186	Diesel fume	2.88E-06	9	0.025	Significant
VGDF	6951	1686	1.22 (1.15-1.30)	3.69E-11	Mists	1.86E-04	10	0.05	Significant

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