

	Supplementary Table 1. Both crude and adjusted results for the main groups of exposures from the N-JEM and self-reported exposure to VGDF obtained from the logistic regression models showing ORs (95% CIs) with change in WAS as the dependent variable			
Exposure variable	N-yes (% of total study population)	Unadjusted	Smoking, age, sex	Adjusted for smoking in 2013, age, sex, asthma in 2013, current strenuous work in 2013, and WAS in 2013
<u>Occupational Exposures: Self-reported</u>				
VGDF-ever	2757 (52.8%)	1.24 (1.11-1.40)	1.24 (1.10-1.40)	1.19 (1.05-1.35)
VGDF-never	2611 (50.0%)	ref	ref	Ref
VGDF-seldom	1308 (25.1%)	0.88 (0.76-1.01)	0.84 (0.75-0.99)	1.00 (0.86-1.17)
VGDF-weekly	545 (10.4%)	1.34 (1.11-1.62)	1.36 (1.12-1.64)	1.42 (1.14-1.76)
VGDF-daily	755 (14.5%)	1.47 (1.25-1.73)	1.42 (1.20-1.68)	1.51 (1.34-1.81)
<u>Occupational Exposures: Assessed with N-JEM*</u>				
High molecular weight substances	559 (10.7%)	1.30 (1.08-1.56)	1.29 (1.06-1.56)	1.31 (1.07-1.59)**
Low molecular weight substances	266 (5.1%)	1.09 (0.84-1.43)	1.06 (0.81-1.39)	1.05 (0.79-1.38)**
Irritants	1158 (22.2%)	1.26 (1.09-1.45)	1.27 (1.10-1.48)	1.29 (1.10-1.51)**
Peak exposure	122 (2.3%)	1.09 (0.74-1.62)	1.11 (0.74-1.66)	0.96 (0.63-1.46)**
Uncertain/low	391 (7.5%)	1.02 (0.82-1.28)	1.03 (0.82-1.30)	1.11 (0.88-1.41)**
Unexposed	3005 (57.6%)	ref	ref	Ref
*Based on occupation in 2013 **Mutually adjusted in one model.				

WAS, work ability score; OR, odds ratio; CI, confidence interval, N-JEM, northern European job-exposure matrix; VGDF, vapors, gases, dust, and fumes

Supplementary Table 2. Both crude and adjusted results for specific exposures derived from the N-JEM obtained from the logistic regression models showing ORs (95% CI) with change in WAS in 2018 as the dependent variable				
Exposure variable	N-yes (% of total study population)	Unadjusted	Adjusted for smoking in 2013, age, sex OR _{adj} , (95% CI)	Adjusted for smoking in 2013, age, sex, asthma in 2013, WAS in 2013, and current strenuous work in 2013 OR _{adj} , (95% CI)
<u>Occupational Exposures: Assessed with N-JEM*</u>				
Animal agents	81 (1.6%)	0.75 (0.45-1.24)	0.82 (0.49-1.37)	0.80 (0.47-1.34)
Mold	71 (1.4%)	0.90 (0.53-1.52)	0.92 (0.54-1.55)	0.88 (0.51-1.50)
Latex	372 (7.1%)	1.20 (0.96-1.50)	1.17 (0.93-1.47)	1.11 (0.88-1.41)
Pharmaceuticals	285 (5.5%)	1.33 (1.04-1.71)	1.31 (1.00-1.69)	1.25 (0.96-1.62)
Acrylates	98 (1.9%)	0.98 (0.63-1.51)	0.98 (0.63-1.52)	0.97 (0.62-1.51)
Epoxy	76 (1.5%)	0.92 (0.56-1.51)	0.87 (0.53-1.45)	0.81 (0.49-1.36)
Diisocyanates	114 (2.2%)	1.02 (0.67-1.53)	0.97 (0.64-1.48)	0.92 (0.60-1.41)
Other reactive agents	89 (1.7%)	1.39 (0.89-2.15)	1.37 (0.88-2.13)	1.36 (0.87-2.13)
Cleaning agents	108 (2.1%)	1.67 (1.12-2.48)	1.59 (1.06-2.37)	1.63 (1.08-2.45)
Wood and paper dust	131 (2.5%)	1.19 (0.82-1.73)	1.18 (0.81-1.73)	1.14 (0.78-1.67)
Inorganic dust	334 (6.4%)	1.05 (0.83-1.34)	1.04 (0.80-1.34)	0.97 (0.75-1.26)
Welding fumes	63 (1.2%)	1.02 (0.58-1.79)	1.03 (0.58-1.82)	1.01 (0.57-1.80)
Metal working fluids	73 (1.4%)	1.21 (0.73-2.00)	1.18 (0.71-1.96)	1.14 (0.68-1.90)
Exhaust	530 (10.2%)	1.15 (0.95-1.39)	1.14 (0.94-1.39)	1.12 (0.92-1.36)
Environmental tobacco smoke	94 (1.8%)	0.97 (0.62-1.51)	1.07 (0.68-1.68)	1.03 (0.66-1.63)
Mixed agricultural agents	57 (1.1%)	2.41 (1.41-4.12)	2.40 (1.40-4.13)	2.42 (1.39-4.21)
Only exposures reported by more than 1% of the study population were assessed. *Based on occupation in 2013				

Statistically significant findings (p <0.05) are bolded				
---	--	--	--	--

WAS, work ability score; OR, odds ratio; CI, confidence interval, N-JEM, northern European job-exposure matrix

ACCEPTED

Supplementary Table 3. Associations (OR) between change in WAS in 2018 and exposures to main groups of agents derived from the N-JEM and self-reported exposure to VGDF stratified by physician-diagnosed asthma in 2013

Exposure variable	No asthma in 2013 (n=4719)		Asthma in 2013 (n=498)	
<u>Occupational Exposures:</u> <u>Self-reported</u>	n= (% of total stratum)		n= (% of total stratum)	
VGDF-ever	2192 (46.5%)	1.15 (1.01-1.32)	266 (53.4%)	1.53 (1.00-2.34)
VGDF-never	2388 (50.6%)	Ref	221 (44.4%)	Ref
VGDF-seldom	1182 (25.0%)	0.97 (0.82-1.14)	126 (25.3%)	1.33 (0.81-2.17)
VGDF-weekly	743 (10.0%)	1.39 (1.11-1.75)	72 (14.5%)	1.68 (0.89-3.16)
VGDF-daily	676 (14.3%)	1.47 (1.21-1.80)	79 (15.9%)	1.57 (0.78-2.82)
<u>Occupational Exposures:</u> <u>Assessed with N-JEM**</u>				
High molecular weight substances*	507 (10.7%)	1.30 (1.05-1.59)	52 (10.4%)	1.49 (0.80-2.7)
Low molecular weight substances*	243 (5.1%)	0.99 (0.74-1.33)	23 (4.6%)	1.75 (0.69-4.46)
Irritants*	1043 (22.1%)	1.24 (1.05-1.42)	115 (23.1%)	1.65 (1.00-2.71)
Peak exposure*	115 (2.4%)	0.96 (0.63-1.48)	7 (1.4%)	0.84 (0.13-5.53)
Uncertain/low exposed*	355 (7.5%)	1.09 (0.84-1.40)	36 (7.2%)	1.29 (0.61-2.75)
Reference	2716 (57.6%)	Ref	289 (58.0%)	Ref
*Adjusted for each other in one model **Based on occupation in 2013 Logistic regression models showed ORs (95% CI) stratified by physician-diagnosed asthma and adjusted for age, sex, current strenuous work in 2013, WAS in 2013, and smoking in 2013. Statistically significant findings (p <0.05) are bolded.				

WAS, work ability score; OR, odds ratio; CI, confidence interval, N-JEM, northern European job-exposure matrix; VGDF, vapors, gases, dust, and fumes

STROBE Statement—Checklist of items that should be included in reports of *cohort studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Title, page 1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2,3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3,4
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	3
		(b) For matched studies, give matching criteria and number of exposed and unexposed	Not applicable
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4,5,6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4,5,6
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6,7
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6,7
		(b) Describe any methods used to examine subgroups and interactions	7
		(c) Explain how missing data were addressed	7
		(d) If applicable, explain how loss to follow-up was addressed	13
		(e) Describe any sensitivity analyses	9,12,13
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	3,4,7

		(b) Give reasons for non-participation at each stage	3,4,7
		(c) Consider use of a flow diagram	Chose not to use
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7 and table 1
		(b) Indicate number of participants with missing data for each variable of interest	Table 2,3,4
		(c) Summarise follow-up time (eg, average and total amount)	Not applicable
Outcome data	15*	Report numbers of outcome events or summary measures over time	Tables 2,3 and 4
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables 2,3,4
		(b) Report category boundaries when continuous variables were categorized	No such variables
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not relevant
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9, 12,13
Discussion			
Key results	18	Summarise key results with reference to study objectives	9, 14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13,14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Title page

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at <http://www.strobe-statement.org>.