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Title: Asthma and COPD in cleaners from Northern Europe

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Body: Introduction: There are few studies on asthma in cleaners from Northern Europe, and very limited knowledge of COPD-risk in cleaners. Aims and objectives: To assess airway symptoms and obstructive lung disease in relation to years having worked as a cleaner in Northern Europe. Methods: Respiratory Health In Northern Europe (RHINE) is a postal questionnaire follow-up study of the ECRHS I stage I cohort established in 1990-94. At the follow-up RHINE III (in 2010-12), 13405 subjects responded to the questions "have you ever worked as a cleaner" ("Yes" n=2114) and numbers of years in such work. Associations with self-reported asthma, respiratory symptoms and doctor's diagnosed COPD were analysed with multiple

logistic regression, adjusting for sex, smoking, age, education and centre. Results: Ever having worked as a cleaner was significantly associated with respiratory symptoms, asthma and COPD. This was only found for those who had worked with cleaning more than one year, while there was no clear difference between having worked with cleaning >1 to 4 years vs ≥4 years with cleaning.

Time worked as cleaner	OR (95% CI)		
	≤1 year (n=676)	>1 to 4 years (n=560)	≥4 years (n=766)
Wheeze last 12 months	1,2 (1,0 - 1,5)	1,6 (1,3 - 2,2)	1,8 (1,5 - 2,2)
Asthma symptoms*	1,2 (0,9 - 1,5)	1,7 (1,4 - 2,2)	2,2 (1,8 - 2,7)
Ever asthma	1,0 (0,8 - 1,3)	1,6 (1,2 - 2,0)	1,7 (1,4 - 2,1)
Current asthma medication	0,8 (0,6 - 1,2)	1,7 (1,3 - 2,2)	1,7 (1,3 - 2,2)
Doctor's diagnosed COPD	1,4 (0,9 - 2,3)	1,8 (1,2 - 2,9)	1,8 (1,2 - 2,6)

*Yes to three or more of questions 1-6 in the RHINE III questionnaire.

Conclusion: Working as a cleaner for more than one year was associated with an increased occurrence of respiratory symptoms and obstructive lung disease.