Abstract P52 Table 1 Effect direction plot summarising direction of outcome domains of included studies

Study	Study design	Symptoms (validated)	Symptoms (non-validated)	Objective measures	Healthcare utilisation
Hatzelis et al, 2012	CS		▲	▲	
Nacci et al, 2011	O/U		▲		
Pinho et al, 1997	CS			▲	
Baxter et al, 2019	O/U	▼		◄►	▲
Haines et al, 2016	O/U	▲			
Halevi-Katz, 2019	O/U	▲		◄►	
Krammer et al, 2017	O/C		▲		▲
Marcinow et al, 2015	O/U		▲		
Mathers-Schmidt & Brilla, 2005	CS		▲	◄►	
Murry et al, 2010	O/U	◄►	▲	▲	
Olley et al, 2013	O/U	▲		▲	
Pargeter & Mansur, 2016	O/U		▲		▲
Sandnes et al, 2019	O/U		▲	◄►	
Shin et al, 2018	O/U		◄►		
Wames et al, 2005	CS		▲	▲	

Legend:
 Study design: O/U Observational non-randomised uncontrolled before and after; O/C Observational non-randomised controlled before and after; CS Case Study
 Effect direction: upward arrow ▲ = positive impact; downward arrow ▼ = negative impact; sideways arrow ◄► = no change/mixed effects/conflicting findings
 Sample size: Final sample size (individuals) in intervention group. Large arrow ▲ >300; medium arrow ▲ 50-300; small arrow ▲ <50
 Study quality: denoted by row colour and Joanna Briggs Institute ratings assigned: light grey = low risk of bias; Medium grey = some concerns; dark grey = high risk of bias

due to heterogeneity of studies (PROSPERO registration number:CRD42020213187).

Results Initial searching identified 3,359 records. Full text screening occurred in 92 records and 15 studies, comprising 555 participants, were deemed eligible. All studies were low level evidence (observational by design, with four case reports), with a high risk of bias; no studies contained control arms. Intervention description was inconsistently and poorly described but direction of effect was positive in 74% of outcomes measured (table 1). The majority of studies showed a reduction in symptom scores and improved direct laryngeal imaging post-intervention; there was an overall reduction, 59.5%, in healthcare utilisation.

Conclusion The literature is in an embryonic state and lacks robust data to truly inform on the effectiveness of existing non-pharmacological interventions used to treat adults with ILO. However, positive signals in the synthesis performed support non-pharmacological treatment approaches and further development is warranted.

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COMBINED EXPOSURE TO VAPORS, GASES, DUSTS, FUMES AND TOBACCO SMOKE INCREASES THE RISK OF ASTHMA SYMPTOMS ESPECIALLY IN ADULT-DIAGNOSED ASTHMA

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10.1136/thorax-2021-BTSabstracts.163

Background Smoking and occupational airborne exposures are known to increase asthma symptoms, but less is known about their influence by the age of asthma diagnosis.

Objective To evaluate the effect of exposures to VGDF (vapors, gases, dusts and fumes), tobacco smoke and their combination for asthma symptoms comparing subjects with asthma diagnosed in childhood and adulthood.

Methods A random sample of 16 000 adults aged 20–69 years were invited to a postal survey on obstructive pulmonary diseases in Finland in 2016. Those reporting physician-diagnosed asthma and age at diagnosis were included in the analysis and their reported VGDF-exposure and smoking habits were analyzed. Age 18 years was chosen to delineate child- and adult-diagnosed asthma.

Results 8199 (51.5%) responded. Of the responders, 831 reported physician-diagnosed asthma. 41% of asthmatics reported child-diagnosed and 59% adult-diagnosed asthma. Current smoking was reported by 25.2% and 20.2% and VGDF exposure by 31.3% and 44.7% in child- diagnosed and adult-diagnosed asthma, respectively. Combined VGDF-exposure and current smoking was reported by 9.7% and 10.6%, respectively.

Compared to the unexposed, those with asthma diagnosed in childhood and with combined current smoking and VGDF exposure, had higher prevalence of wheeze (69.7% vs 39.5%, p=0.009), sputum production (39.4% vs 11.4%, p=0.001) and morning dyspnea (42.4% vs 21.9%, p=0.002). Corresponding pattern was seen in those with asthma diagnosed in adulthood; for wheeze (78.8% vs 53.6%, p=0.007), sputum production (40.4% vs 25.0%, p=0.014) and morning dyspnea (65.4% vs 42.0%, p=0.008). Child-diagnosed asthmatics both without exposure history (46.5% vs 69.6%, p=0.001) and with combined exposure to smoking and VGDF (66.7% vs 94.2%, p=0.003) reported less often ≥3 symptoms compared to adult-diagnosed asthmatics, even though they reported less frequently use of asthma medication (60.7% vs 82.0%, p>0.001). Smoking asthmatics with adult-diagnosis and exposure to VGDF had the highest prevalence estimates of having multiple symptoms (94.2%) in our study.

Conclusion Although asthmatics diagnosed in child- and adulthood reported symptoms related to exposure to smoking and

VGDF, symptoms were reported more often by those with adult diagnosis. The results indicate the importance of targeted asthma treatment and follow-up by patient's exposure history and asthma diagnosis age.

P54 COMBINED EXPOSURE TO VAPORS, GASES, DUSTS, FUMES AND TOBACCO SMOKE INCREASES THE RISK OF ASTHMA SYMPTOMS

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10.1136/thorax-2021-BTSAbstracts.164

Background Occupational exposure to vapors, gases, dusts and fumes (VGDF) is known to increase the prevalence of asthma symptoms. Less is known about the prevalence of asthma symptoms if VGDF exposure is combined to smoking or environmental tobacco smoke exposure.

Objective To test the hypothesis that combined exposure to VGDF and tobacco smoke would have an additive effect on the risk for being symptomatic in responders with physician diagnosed asthma.

Methods A random sample of 16 000 adults aged 20 to 69 years were invited to a postal survey on obstructive pulmonary diseases in Finland in 2016. Those who reported physician diagnosed asthma were included in the analysis and their reported VGDF exposure and smoking habits were analyzed. Being symptomatic was defined as an affirmative answer to three or more questions of asthma symptoms.

Results 8199 (51.5%) subjects responded. Of the responders, 831 reported physician-diagnosed asthma. 22.3% of asthmatics reported current smoking, 23.2% exposure to environmental tobacco smoke and 39.4% occupational exposure to VGDF. 14.0% reported combined exposure to environmental tobacco smoke and VGDF, and 10.2% exposure to VGDF and smoking. The prevalence of being symptomatic was increased in smokers (73.0% vs 58.0%, $p=0.005$) and in responders with occupational exposure to VGDF (75.2% vs 58.0%, $p<0.001$) compared to unexposed asthmatics. The highest prevalence estimates were seen in smokers with VGDF exposure (83.5% vs 58.0%, $p<0.001$) and in responders with exposure to both VGDF and environmental tobacco smoke (85.3% vs 58.0%, $p<0.001$) suggesting their additive effect on the prevalence of asthma symptoms. There was no difference in asthma medication use between responders with no exposure history, smokers or those with environmental tobacco smoke or occupational VGDF exposure.

Conclusion Our results indicate an increased prevalence of asthma symptoms in adult asthmatics with exposure to VGDF and tobacco smoke. Asthmatics with exposure to both environmental tobacco smoke and VGDF had the highest

prevalence estimates of asthma symptoms suggesting an additive effect. These results suggest the importance of prevention of occupational airborne exposures and smoking cessation in asthma treatment.

P55 OCCUPATIONS, WORKPLACE EXPOSURES AND PHYSICAL DEMANDS OF WORK IN PATIENTS WITH SEVERE ASTHMA

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10.1136/thorax-2021-BTSAbstracts.165

Introduction Patients with severe asthma are a group distinct from those with mild or moderate disease, due to their complex healthcare needs. Employment is common in this group, and complete work disability unusual. Asthma-related loss of productivity may be higher compared with patients with non-severe asthma, and has been attributed to both physical and psychological impairments. We aimed to gain an understanding of the nature of work undertaken by patients with severe asthma.

Methods We searched the Birmingham (UK) Regional Severe Asthma Service (BRSAS) Dendrite clinical registry and included baseline demographic, current employment, and asthma-specific health data on employed patients (see figure). Recorded occupations for each included patient were processed by: (i) assigning a 4-digit SOC-2010 code, (ii) applying the OASJEM (job exposure matrix¹) to determine likelihood of exposure to airway irritants and respiratory sensitizers, and (iii) assigning a 'physical demand' category (sedentary to very-heavy), using the Dictionary of Occupational Titles (DOT²).

Results Data from $n=548$ patients were included (53% of severe asthmatics were employed, 86% of those working full-time); median age=44 (IQR=33–52), females=367 (67%), Caucasian ethnicity=453 (84), current smokers=27 (5), median IMD decile=5 (2–7), median BMI=30 (25–35), ≥ 1

Abstract P55 Figure 1