Dirty jobs …

Occupational COPD among Danish **never smokers** – A population-based study

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Background

- Occupational exposure to vapour, gas, dust, and fume (VGDF) is an essential risk factor for chronic obstructive pulmonary disease (COPD) among never smokers.
- The population attributable fraction (PAF) for COPD caused by occupational exposure is estimated to be 26-43% among never-smokers.

Aim

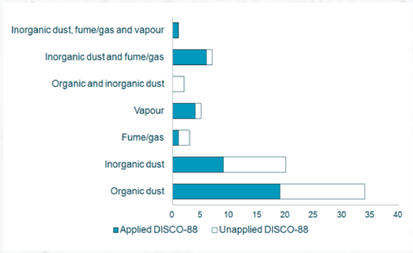
1. Prevalence of COPD among never smokers
2. Association between occupational exposure and COPD among never smokers
3. Population attributable fraction for the proportion of COPD due to work related exposures

Methods

- A mixed urban/rural cross-sectional population-based study. **Figure 1**: Flow chart, never smokers accounted for 33% (N=1575)
- Place and timeframe: Denmark, **Figure 2**, from October 2004 until September 2006
- Aged 45-84
- COPD definition: Forced expiratory volume per second (FEV_1)/forced vital capacity (FVC) z-score <2 standard deviations and FEV_1 z-score <2 by the method of lower limit of normal (LLN).
- Reference population: The Global Lung Function 2012 Equations
- Exposures assessment: The Danish version of The International Standard Classification of Occupations (DISCO-88) and expert derived assessment selected jobs with known exposure to VGDF. Occupational history was obtained by a questionnaire. Exposures were dichotomised as ever or never exposed.
- Analysed in a mixed random effect logistic regression model, with GP practice as a random variable, and sex and age as fixed effects.
- The PAF for COPD was estimated as the proportion of cases exposed*(OR-1)/OR

Figure 2

Figure 3



Table

Occupational risk of COPD among never smokers

		Odds Ratio (OR)			
		Crude		Adjusted	
	n	OR	95% CI	OR	95% CI
VGDF occupational exposure					
No exposure	831	1.00	Reference	1.00	Reference
Any VGDF exposure	655	**2.41**	**(1.02-5.72)**	**3.69**	**(1.36-10.04)**
Organic dust occupational exposure					
No exposure	733	1.00	Reference	1.00	Reference
Any organic exposure	562	2.15	(0.88-5.21)	**2.94**	**(1.05-8.22)**

Figure 1

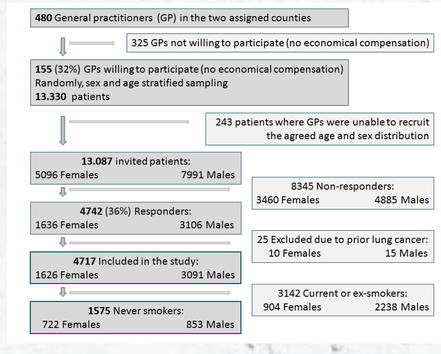
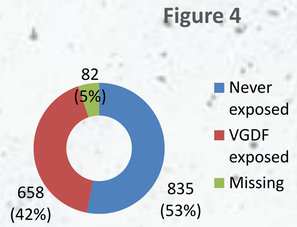


Figure 4



Results

- Of 372 DISCO-88 codes 72 were identified with VGDF exposure, **Figure 3**.
- Occupational exposure were present in 658 (42%) subjects (**Figure 4**) in between 1 (72%) and 5 jobs. Organic dust exposure was the dominating exposure (86%) while exposure to vapour, gas/fume, and inorganic dust was less common, 5%, 16%, and 21%, respectively.

1. COPD was present in 26 subjects equal to a prevalence of 1.7%.
2. The **Table** shows the crude and adjusted associations between the occupational exposures and COPD. Increased risk of COPD was found for subjects exposed to VGDF and organic dust.

- Excluding 145 never smokers with prior self-reported asthma provided similar associations; VGDF: OR 2.64 (95% CI 0.70-9.92), organic dust: OR 3.43 (95% CI 0.86-13.70).

3. The study PAF for COPD caused by occupational exposure was 48% for VGDF exposure and 41% for organic dust exposure only.

Conclusions

- **In never smokers the risk for COPD was increased more than three times when occupational exposed to VGDF and three fold for organic dust.**
- **We found an even higher PAF for COPD than revealed by earlier review. Signifying that the occupational exposures contribute substantial to the burden of COPD in never smokers.**
- **The high influence of organic dust exposure might reflect a special Danish occupational exposure scenario.**

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