The aim of the study was to evaluate the health of the exposed population compared to control population.

Methods: Six months after the eruption, (fall and winter 2010-11), 1148 exposed South Icelanders and 510 unexposed North Icelanders responded to a questionnaire on recent physical symptoms and questions from the European Community Respiratory Health questionnaire. The data was analyzed using logistic regression adjusted for age, gender, education and smoking status.

Results: Demographic characteristics and underlying disease rates were similar in the two groups. The exposed group reported more symptoms during the last 12 months; morning phlegm in winter, OR 1.5 (95%CI 1.3-1.8) and runny or stuffed nose, OR 1.4 (95%CI 1.2-1.6). Recent (last month) symptoms were more increased, for example cough, OR 2.6 (95%CI 1.7-3.8) and phlegm, OR 2.1 (95%CI 1.3-3.2), eye irritation, OR 2.9 (95%CI 1.8-4.5) and runny or irritated nose, OR 2.0 (95%CI 1.4-2.9). Respiratory symptoms were more prevalent among those living closest to the volcano. Upper airway symptoms coexisted, so those who reported one symptom were likely to have others also.

Discussion: Six months after the Eyjafjallajökull eruption our results indicate that the presence of volcanic ash is associated with two to three times higher recent upper airway symptom rates among the exposed population compared to the unexposed.

Conclusion: Exposure to volcanic ash may increase respiratory morbidity symptoms six months post eruption, but long-term consequences are still unknown.

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Outdoor exposure to formaldehyde is associated with increased DNA damage and respiratory symptoms in children

Paolo Girardi¹, Maria Enrica Fracasso², Alessandro Marcon¹, Denise Doria², Linda Guarda³, Pierpaolo Marchetti¹, Giancarlo Pesce¹, Vanda Pironi³, Giorgio Siliprandi⁴, Paolo Ricci³, Roberto de Marco¹. ¹Unit of Epidemiology and Medical Statistics, University of Verona, Italy; ²Section of Pharmacology, University of Verona, Italy: ³Unit of Epidemiology, NHS Mantua, Mantua, Italy; ⁴Department of Mantua, Environmental Protection Agency, Mantua, Italy

Background: Exposure to air pollutants emitted by industrial sources may be a health hazard for children living nearby.

Objectives: To evaluate whether residential outdoor exposure to formaldehyde was associated with DNA damage and with respiratory symptoms in children who lived in the largest chipboard manufacturing area in Northern Italy (Viadana).

Methods: In 2010, randomly selected children (6-12 years) living in the Viadana district were surveyed through a parental questionnaire on respiratory symptoms. A score was devised to evaluate the presence/intensity of asthma-like symptoms. DNA strand breaks and nuclear abnormalities of the oral mucosa cells were (n=63) were installed in the area to monitor formaldehyde both in winter and summer 2010. Kriging interpolation was used to estimate the concentration of formaldehyde of each child. Appropriate regression models were fitted to the data. **Results:** 417 out of 656 eligible children (64%) took part in the study. Children living near (<2km) the chipboard factories had the highest (p<0.001) formaldehyde exposure. A 1-standard deviation increase in formaldehyde (+0.16 μ g/m³) was associated with an increase of 10% (95%CI: 5-20%) in the comet tail intensity and of 10% (95%CI: 1-19%) in the frequency of nuclear buds. Children exposed to the highest level of formaldehyde (>85th centile) had an increased risk of asthma like symptoms (OR=2.1: 1.1-4.2).

Conclusions: Exposure to pollutants emitted by chipboard industries statistically significantly increased DNA damage and asthma-like symptoms in children.

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Confirmed moisture damage and risk of asthma from birth to age 6 years Juha Pekkanen¹, Anne M. Karvonen¹, Matti Korppi², Jon Genuneit³,

Anne Hyvärinen¹. ¹Department of Environmental Health, National Institute for Health and Welfare, Kuopio, Finland; ²Pediatric Research Center, Tampere University and University Hospital, Tampere, Finland; ³Institute of Epidemiology and Medical Biometry, Ulm University, Ulm, Germany

Introduction: Few cohort studies are available on the association between moisture damage, confirmed by technical inspection, and risk of new asthma. **Aim:** To study the association between confirmed moisture damage at the age of

Aim: To study the association between confirmed moisture damage at the age of 5 months on average and risk of asthma by the age of 6 years.

Methods: Building inspection was performed by building engineers in the homes of 394 children, and the children were followed up with repeated questionnaires from birth to the age of 6 years. Current asthma was defined as doctor diagnoses of asthma ever and either current asthma medication or wheezing symptoms at the age of 6 years. Odds ratios (OR) were adjusted for potential confounders using discrete time hazard model and GEE.

Results: Severe moisture damage in the kitchen (OR 2.80, 95%CI 1.02-7.64) or in the child's bedroom (OR 3.65, 95%CI 1.00-13.28) and visible mold in the child's bedroom (OR 4.02, 95%CI 1.58-10.21) increased the incidence of doctor diagnosed asthma ever in life (n=60). Similar associations were observed with current asthma (n=33) and with wheezing apart from cold. Weaker associations were observed with moisture damage in the main living areas. No consistent associations were observed with moisture damage in the bathrooms or in other interior spaces of the house. There was some suggestion that the associations were weaker during the latter part of the follow-up.

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Eyjafjallajökull 2010: Respiratory morbidity and symptoms following exposure to a volcanic eruption

Hanne Krage Carlsen^{1,2}, Arna Hauksdóttir¹, Unnur Anna Valdimarsdóttir¹, Ragnhildur Gudrun Finnbjornsdottir¹, Guðrún Pétursdóttir³, Thorarinn Gíslason^{4,5}. ¹Centre of Public Health Sciences, University of Iceland, Reykjavík, Iceland; ²Occupational and Environmental Medicine, Umeå University, Umeå, Sweden; ³Institute for Sustainability Studies, University of Iceland, Reykjavík, Iceland; ⁴Respiratory Medicine and Sleep, Landspítali University Hospital, Reykjavík, Iceland; ⁵Faculty of Medicine, University of Iceland, Reykjavík, Iceland

Background: The eruption of Eyjafjallajökull, Iceland 2010 posed an opportunity to study health effects of a volcanic eruption in a society with strong infrastructure.

Conclusions: The results are consistent with our earlier report over the first 1.5 years of life (Karvonen et al. 2009). The results support earlier conclusions that moisture damage not only increases the risk of respiratory symptoms, but is also associated with increased risk of developing new asthma.

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Home dampness and mould, $\beta(1,3)$ -D-glucan in mattress dust and respiratory symptoms in adults from 10 European countries

Jan-Paul Zock¹, Gert Doekes², Dan Norbäck³, Mario Olivieri⁴, Simona Villani⁵, Juha Pekkanen⁶, Dick Heederik², Joachim Heinrich⁷, Deborah Jarvis⁸, Anne Hyvärinen⁶. ¹Centre for Research in Environmental Epidemiology (CREAL), Hospital del Mar Research Institute (IMIM), Barcelona, Spain; ²Division of Environmental Epidemiology, Institute for Risk Assessment Sciences (IRAS), Utrecht, Netherlands; ³Department of Medical Sciences, Uppsala University, Uppsala, Sweden; ⁴Unit of Occupational Medicine, University Hospital, Verona, Italy; ⁵Department of Health Science, University of Pavia, Italy; ⁶Department of Environmental Health, National Institute for Health and Welfare (THL), Kuopio, Finland; ⁷Institute for Epidemiology, Helmholtz Zentrum München, Munich, Germany; ⁸Respiratory Epidemiology and Public Health Group, Imperial College, London, United Kingdom

 $\beta\mbox{-glucans}$ are pro-inflammatory fungal cell wall components that have been associated with adverse respiratory health effects in children. We measured $\beta(1,3)$ -D-glucans in mattress dust samples from 973 randomly selected adults from 22 ECRHS study centres in 10 European countries using an enzyme immunoassay. Information on respiratory symptoms, housing characteristics, dampness and mould was obtained by face-to-face interviews and home visits following a common protocol. Study centre explained 28% of the total variance in glucan concentration with geometric means ranging from 0.40 µg/mg in Reykjavik, Iceland, to 1.77 $\mu\text{g/mg}$ in Barcelona, Spain. Damp or mould problems in the previous year were reported by 30% of the participants (range 11-50% across centres) and was significantly associated with a 10% higher glucan level when controlling for centre. Mattresses older than 5 years contained on average 20% more glucan than mattresses less than one year old. The presence of a cat or a dog in the home increased 17-24% the glucan concentration. Nasal symptoms in the previous year (overall 38%) were more prevalent when damp or mould was reported (adjusted Odds Ratio (OR) 1.35; 95%CI 1.00-1.82). However, nasal symptoms were not associated with glucan level (OR 1.00 without indications for heterogeneity across centres). Similarly there was no association of asthma symptom score with mattress glucan level. In conclusion, $\beta(1,3)$ -D-glucans are ubiquitous in mattress dust from European homes. Although weakly associated with damp and mould problems there was no evidence that mattress levels of $\beta(1,3)$ -D-glucans were associated with respiratory health in adults.

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Exhaled nitrogen oxide (FeNO) and nasal patency in adults in relation to levels of airborne fungal DNA in dwellings in Lund, Sweden

Gunilla Wieslander¹, Guihong Cai¹, Christina Isaxson², Anders Gudmundsson², Mats Bohgard², Erik Nordin², Aneta Wierzbicka², Dan Norbäck¹. ¹Dept. of Medical Science, Uppsala University, Occupational and Environmental Medicine, Uppsala, Sweden; ²LTH, Lund University, Division of Ergonomics and Aerosol Technology, Lund, Sweden

Background: Questionnaire studies have reported associations between indoor moulds and dampness, asthma and rhinitis. We investigated if levels of fungal DNA in dwellings were associated with nasal patency, tear film stability, and levels of exhaled NO

Methods: Totally 49 adults from 42 homes, randomly selected from a larger population survey in the city of Lund, Scania, Sweden. Exhaled NO was measured by NIOX MINO (50 ml/min). Nasal patency was measured by acoustic rhinometry. Tear film break up time (BUT) was monitored as a sign of eye irritation. FeNO was log-transformed and associations were analysed by multiple linear regression, adjusting for age, gender, pollen/furry pet allergy and smoking. Fungal DNA in airborne settled dust was measured in the living room for one weekby Petri dish method and levels of five fungal DNA-sequences were analysed by QPCR.

Results: Three types of fungal DNA was commonly found in the homes. Exhaled NO was higher at higher concentrations of total fungal DNA (p=0.04). Mean cross-sectional area in the front part of the nasal cavity was decreased at higher levels of Aspergillus/Penicillium DNA (p=0.05), and posterior cross-sectional area was decreased at higher levels of Aspergillus versilcolor DNA (p=0.05). No associations were found between BUT and fungal DNA.

Conclusion: Fungal DNA in settled dust in random selected ordinary homes can be a risk factor for nasal inflammation, measured as decreased nasal patency, and lower airway inflammation measured as exhaled NO.

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Lung function decline in elderly in relation to phthalate metabolites and bisphenol A levels in serum: A 5-year prospective study

Dan Norbäck¹, P. Monica Lind¹, Gunilla Wieslander¹, Lars Lind². ¹Dept. of Medical Science, Occupational and Environmental Medicine, Uppsala University, Uppsala, Sweden; ²Dept. of Medical Science, Acute and Internal Medicine, Uppsala University, Uppsala, Sweden

Background: Some recent studies report associations between phthalate exposure and asthma in pre-school children. We investigated if circulating levels of phthalates and bisphenol A (BPA) predicts lung function decline in an elderly population

Methods: PIVUS is a cohort, based on a population sample of subjects, aged 70 years in Uppsala, Sweden. Circulating levels of BPA and phthalate metabolites in serum was measured at baseline by LC-MS/MS. Lung function was measured at baseline and after 5 years in 668 subjects. Change of forced expiratory volume in 1 s (FEV1) was calculated. Associations were analysed by multivariate modelling adjusting for height, smoking at 70 and 75 y, pack years of tobacco at 70 y, education level, exercise habits and gender, using ln transformed values for circulating levels, excluding 36 subjects with asthma or COPD at baseline

Results: BPA median level was 3.75 ng/mL, Monethyl hexyl phtalate (MEHP) 4.51 ng/mL, monethyl phtalate (MEP) 11.6 ng/mL, Monoisobutyl phtalate (MiBP) 13.5 ng/mL, and Monomethyl phtalate (MEHP) 1.51 ng/mL, with no gender differences. The annual decline in FEV1 was -55.6 ml/year. MEHP was associated with an additional decline in FEV1 of -6.0 ml/year (95% CI -8.6 to -3.4) (p<0.001), while MMP was associated with an additional improvement in FEV1 of 6.6 ml/year (95% CI 3.2 to 9.8) (p<0.001), The association for MEHP was significant in both men and women, while the association for MMP was significant in women, only. Discussion: Associations between circulating levels of some phthalates metabolites and the five year decline of FEV1 were found, with MEHP as a risk factor for lung function decline.

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Measuring concern about pollution in questionnaire-based environmental surveys

Alessandro Marcon¹, Giang Nguyen¹, Marco Braggion², Marta Rava³, Maria Elisabetta Zanolin¹. ¹Unit of Epidemiology and Medical Statistics, University of Verona, Italy; ²Department of Economics, Ca' Foscari University, Venice, Italy; ³Centre for Research in Epidemiology and Population Health, University Paris Sud, Paris, France

Understanding attitudes towards pollution in the population might help to prevent bias in questionnaire-based environmental studies, because subjects living closer to emission sources may be more concerned than those who live farther away, thus tending to over-report adverse health outcomes.

Using data from a survey on parents of 3697 school-age children (response rate 99%) in an industrial area in northern Italy (Viadana), we devised a score on environmental concerns (EC), evaluated its psychometric properties and its association with several determinants.

Six questions surveyed respondents' concerns about electromagnetic fields (EMFs),

traffic, lack of public parks, air pollution, indoor cigarette smoke and chemicals in food. Answers were coded as 0 (don't know/not at all), 1 (a little), 2 (quite a lot), 3 (a lot). Explanatory factor analysis (EFA) and homogeneity analysis were performed. A summed score was computed (range 0-18). The association between a 1-unit increase in the score and potential determinants was estimated by relative

a 1-unit increase in the score and potential determinants was estimated by relative risks (RRs), obtained by negative binomial regression. EFA identified one unique factor, explaining 61% of the variance. The homogeneity analysis revealed its good internal reliability (Cronbach's $\alpha = 0.85$) and confirmed the equidistance of the item options response. Item mean scores ranged from 2.0 ± 1.0 (EMFs) to 2.8 ± 0.7 (air pollution). Fathers, indoor-smokers, low educated and non-Italian parents reported less concerns (RRs=0.59, 0.68, 0.38, and 0.82, respectively) with respect to referral groups (p<0.001). Respondents' characteristics influence their level of EC. The devised score may be useful in future research to control for EC-related confounding.

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