

European Respiratory Society Annual Congress 2013

Abstract Number: 5302

Publication Number: P1549

Abstract Group: 6.1. Epidemiology

Keyword 1: Epidemiology **Keyword 2:** Lung function testing **Keyword 3:** Air pollution

Title: Effect of long-term exposure to traffic-related air pollution on lung function: The ESCAPE project

Dr. Martin 2686 Adam martin.adam@unibas.ch¹, Dr. Tamara 4889 Schikowski tamara.schikowski@unibas.ch¹, Ms. Anne Elie 4891 Carsin acarsin@creal.cat², Mr. Cai 4892 Yutong yutong.cai@imperial.ac.uk³, Ms. Margaux 4893 Sanchez margaux.sanchez@inserm.fr⁴, Dr. Bénédicte 17069 Jacquemin benedicte.jacquemin@inserm.fr MD^{2,4}, Dr. Andrea 4897 Vierkötter andrea.vierkoetter@uni-duesseldorf.de⁵, Mr. Dirk 17091 Keidel dirk.keidel@unibas.ch¹, Dr. Alessandro 17076 Marcon alessandro.marcon@univr.it⁶, Dr. Schindler 17099 Christian christian.schindler@unibas.ch¹, Prof. Jordi 4905 Sunyer Deu jsunyer@creal.cat MD², Prof. Francine 17078 Kauffmann francine.kauffmann@inserm.fr MD⁴, Prof. Ursula 4906 Krämer kraemeru@uni-duesseldorf.de⁵, Dr. Anna 17104 Hansell a.hansell@imperial.ac.uk MD³, Prof. Nino 4907 Künzli nino.kuenzli@unibas.ch MD¹ and Prof. Nicole 4908 Probst-Hensch nicole.probst@unibas.ch¹. ¹ Department of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, Basel, Switzerland, 4002 ; ² Centre for Research in Environmental Epidemiology, Barcelona, Spain, 08003 ; ³ Department of Epidemiology and Biostatistics, MRC-HPA Centre for Environment and Health, London, United Kingdom, W2 1PG ; ⁴ Centre for Research in Epidemiology and Population Health, l'Institut National De La Santé Et De La Recherche Médicale, Paris, France, 75654 ; ⁵ Department of Epidemiology, Leibniz Research Institute for Environmental Medicine, Düsseldorf, Germany, 40225 and ⁶ Department of Public Health and Community Medicine, University of Verona, Verona, Italy, 37134 .

Body: Background. Acute air pollution effects on lung function are well established, while the chronic impact of ambient air pollutants on lung function in adults remains poorly understood. Aims. In the ESCAPE study, we investigated the association of residential traffic-related air pollution with level and decline of lung function in the context of five European cohorts of adults (ECRHS, EGEA, NSHD, SALIA, SAPALDIA). Methods. Residential exposure to nitrogen oxides (NO₂, NO_x) and particulate matter (PM) was obtained from standardized measurement protocols and land use regression models. Traffic load at the road nearest to participants' home and on major roads within a 100 meter buffer was assessed. Level and annual decline in the spirometric parameters FEV₁, FVC, and FEV₁/FVC were considered as outcomes. Study-specific analyses were performed with random effects linear regression adjusting for gender, age, height, BMI, education, smoking status. Cohort-specific results were combined using random-effects meta-analysis. Results. Based on lung function data from 7,613 subjects undergoing spirometry twice over 11 years on average, we observed that a 10 µg/m³ increase in NO₂ exposure was associated with lower levels of FEV₁ (-13.8 mL (95%CI:-25.82,-2.14)) and FVC (-14.93 mL (-28.73,-1.13)). A higher traffic load at the home address also went along with lower levels of FEV₁ and FEV₁/FVC. The observed associations were

particularly observed in women and generally stronger in participants reporting use of respiratory medication. Conclusions. In this analysis of adults mostly living in urban environments, we observed a lung function decline with increased nitrogen oxide or traffic load exposure.