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Title: Effect of air pollution on prevalence of chronic bronchitis symptoms-a cross-sectional analysis of 5 cohort studies

Dr. Yutong 13855 Cai yutong.cai@imperial.ac.uk MD ¹, Dr. Tamara 13856 Schikowski Tamara.Schikowski@unibas.ch MD ², Dr. Andrea 13857 Vierkötter Andrea.Vierkoetter@IUF-Duesseldorf.de ³, Dr. Anne-Elie 13858 Carsin acarsin@creal.cat ⁴, Dr. Margaux 13859 Sanchez margaux.sanchez@inserm.fr ⁵, Dr. Martin 13863 Adam Martin.Adam@unibas.ch ², Dr. Alessandro 13866 Marcon alessandro.marcon@univr.it ⁶, Dr. Raphaelle 13869 Varraso raphaelle.varraso@inserm.fr ⁵, Prof. Francine 13870 Kauffmann francine.kauffmann@inserm.fr ⁵, Dr. Benedicte 13871 Jacquemin benedicte.jacquemin@inserm.fr ⁵, Prof. Nicole 13874 Probst-Hensch Nicole.Probst@unibas.ch ², Prof. Ursula 13875 Krämer kraemeru@uni-duesseldorf.de MD ³, Prof. Christian 13879 Schindler Christian.Schindler@unibas.ch ², Prof. Jordi 13880 Sunyer jsunyer@creal.cat ⁴, Dr. Dirk 13885 Keidel Dirk.Keidel@unibas.ch ², Prof. Nino 13889 Künzli Nino.Kuenzli@unibas.ch MD ² and Dr. Anna L. 13893 Hansell a.hansell@imperial.ac.uk MD ¹. ¹ MRC-HPA Centre for Environment and Health, Department of Epidemiology & Biostatistics, Imperial College London, London, United Kingdom ; ² Epidemiology & Public Health, Swiss Tropical and Public Health Institute, Basel, Switzerland ; ³ Environmental Epidemiology in Allergies, Leibniz Research Institute for Environmental Medicine (IUF), Düsseldorf, Germany ; ⁴ Centre for Research in Environmental Epidemiology (CREAL), CREAL, Barcelona, Spain ; ⁵ Centre for Research in Epidemiology and Population Health, l'Institut National De La Santé Et De La Recherche Médicale (INSERM), Paris, France and ⁶ Unit of Epidemiology and Medical Statistics, Department of Public Health and Community Medicine, University of Verona, Verona, Italy .

Body: Background: Chronic bronchitis symptoms are associated with COPD and overall mortality. This study aims to assess effects of outdoor air pollution on prevalence of chronic bronchitis in five cohort studies (E3N, ECRHS, NSHD, SALIA, SAPALDIA) participating in the European Study of Cohorts for Air Pollution Effects (ESCAPE) project. Methods: Annual average concentrations of particulate matter (PM) and NO₂/NO_x and road traffic measures 2008-11, were assigned to home address at follow-up 2000-2011. Chronic bronchitis symptoms (≥3 months for 2 or more years) were assessed as chronic cough and phlegm, chronic cough and chronic phlegm respectively. Cross-sectional multivariable logistic regression analyses were conducted at each cohort, adjusting for a confounder set common to all studies (age, sex, smoking, interview season, education) followed by random-effect meta-analysis. Results: 13,758 and 8784 participants respectively were included in NO₂ and PM analyses. No consistent associations were observed between any exposure and prevalence of chronic bronchitis. Combined effect estimates for chronic cough and phlegm were (shown as OR (95%CI) per 10µg/m³): NO₂ 0.96 (0.89-1.04) and PM₁₀ 0.85

(0.53-1.39). Corresponding results for never smokers were: NO₂ 0.99 (0.84-1.18) and PM₁₀ 1.34 (0.93-1.93). Similar null associations were seen for chronic cough alone or chronic phlegm. Conclusions: In contrast to some previously published European studies, this study did not find consistent effects of current air pollution exposures level on chronic bronchitis symptoms. Further investigations including use of back-extrapolated air pollution values to actual year of questionnaire are needed.