



# The coexistence of asthma and COPD: risk factors, clinical history and lung function trajectories

Alessandro Marcon <sup>1</sup>, Francesca Locatelli<sup>1</sup>, Shyamali C. Dharmage <sup>2</sup>, Cecilie Svanes<sup>3,4</sup>, Joachim Heinrich<sup>5</sup>, Bénédicte Leynaert <sup>6</sup>, Peter Burney<sup>7,8</sup>, Angelo Corsico<sup>9</sup>, Gulser Caliskan <sup>1</sup>, Lucia Calciano<sup>1</sup>, Thorarinn Gislason<sup>10,11</sup>, Christer Janson <sup>12</sup>, Deborah Jarvis <sup>7,8</sup>, Rain Jögi <sup>13</sup>, Theodore Lytras <sup>14,15</sup>, Andrei Malinovski <sup>16</sup>, Nicole Probst-Hensch<sup>17,18</sup>, Kjell Toren<sup>19</sup>, Lidia Casas<sup>20</sup>, Giuseppe Verlati<sup>1</sup>, Judith Garcia-Aymerich <sup>14,21,22</sup> and Simone Accordini<sup>1</sup> on behalf of the Ageing Lungs in European Cohorts (ALEC) study

<sup>1</sup>Unit of Epidemiology and Medical Statistics, Dept of Diagnostics and Public Health, University of Verona, Verona, Italy. <sup>2</sup>Allergy and Lung Health Unit, School of Population and Global Health, The University of Melbourne, Melbourne, Australia. <sup>3</sup>Centre for International Health, Dept of Global Public Health and Primary Care, University of Bergen, Bergen, Norway. <sup>4</sup>Dept of Occupational Medicine, Haukeland University Hospital, Bergen, Norway. <sup>5</sup>Institute and Outpatient Clinic for Occupational, Social and Environmental Medicine, University Hospital of Ludwig Maximilians University, Comprehensive Pneumology Centre Munich, German Centre for Lung Research, Munich, Germany. <sup>6</sup>Université Paris-Saclay, UVSQ, Université Paris-Sud, Inserm, Équipe d'Épidémiologie Respiratoire Intégrative, CESP, Villejuif, France. <sup>7</sup>National Heart and Lung Institute, Imperial College London, London, UK. <sup>8</sup>MRC-PHE Centre for Environment and Health, Imperial College London, London, UK. <sup>9</sup>Division of Respiratory Diseases, IRCCS Policlinico San Matteo Foundation – Dept of Internal Medicine and Therapeutics, University of Pavia, Pavia, Italy. <sup>10</sup>Dept of Sleep, Landspítali University Hospital, Reykjavik, Iceland. <sup>11</sup>Medical Faculty, University of Iceland, Reykjavik, Iceland. <sup>12</sup>Dept of Medical Sciences: Respiratory, Allergy and Sleep Research, Uppsala University, Uppsala, Sweden. <sup>13</sup>Lung Clinic, Tartu University Hospital, Tartu, Estonia. <sup>14</sup>Institute for Global Health (ISGlobal), Barcelona, Spain. <sup>15</sup>School of Medicine, European University Cyprus, Nicosia, Cyprus. <sup>16</sup>Dept of Medical Sciences: Clinical Physiology, Uppsala University, Uppsala, Sweden. <sup>17</sup>Dept of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, Basel, Switzerland. <sup>18</sup>University of Basel, Basel, Switzerland. <sup>19</sup>Occupational and Environmental Medicine, School of Public Health, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden. <sup>20</sup>Epidemiology and Social Medicine, University of Antwerp, Antwerp, Belgium. <sup>21</sup>Universitat Pompeu Fabra (UPF), Barcelona, Spain. <sup>22</sup>CIBER Epidemiología y Salud Pública (CIBERESP), Barcelona, Spain.

Corresponding author: Alessandro Marcon (alessandro.marcon@univr.it)



Shareable abstract (@ERSpublications)

**The coexistence of asthma and COPD is generally diagnosed in older persons. Nonetheless, prevention of this condition should start in childhood. As a priority, maternal and personal smoking avoidance should be encouraged.** <https://bit.ly/3uQCmIX>

**Cite this article as:** Marcon A, Locatelli F, Dharmage SC, *et al.* The coexistence of asthma and COPD: risk factors, clinical history and lung function trajectories. *Eur Respir J* 2021; 58: 2004656 [DOI: 10.1183/13993003.04656-2020].

This single-page version can be shared freely online.

## Abstract

Patients with concomitant features of asthma and chronic obstructive pulmonary disease (COPD) have a heavy disease burden.

Using data collected prospectively in the European Community Respiratory Health Survey, we compared the risk factors, clinical history and lung function trajectories from early adulthood to late sixties of middle-aged subjects with asthma+COPD (n=179), past (n=263) or current (n=808) asthma alone, COPD alone (n=111) or none of these (n=3477).

Interview data and pre-bronchodilator forced expiratory volume in 1 s (FEV<sub>1</sub>) and forced vital capacity (FVC) were obtained during three clinical examinations in 1991–1993, 1999–2002 and 2010–2013. Disease status was classified in 2010–2013, when the subjects were aged 40–68 years, according to the presence of fixed airflow obstruction (post-bronchodilator FEV<sub>1</sub>/FVC below the lower limit of normal), a lifetime history of asthma and cumulative exposure to tobacco or occupational inhalants. Previous lung function trajectories, clinical characteristics and risk factors of these phenotypes were estimated.

Copyright ©The authors 2021.

This version is distributed under the terms of the Creative Commons Attribution Non-Commercial Licence 4.0. For commercial reproduction rights and permissions contact [permissions@ersnet.org](mailto:permissions@ersnet.org)

This article has supplementary material available from [erj.ersjournals.com](http://erj.ersjournals.com)

This article has an editorial commentary:

<https://doi.org/10.1183/13993003.01329-2021>

Received: 30 Dec 2020  
Accepted: 6 April 2021



Subjects with asthma+COPD reported maternal smoking (28.2%) and respiratory infections in childhood (19.1%) more frequently than subjects with COPD alone (20.9% and 14.0%, respectively). Subjects with asthma+COPD had an impairment of lung function at age 20 years that tracked over adulthood, and more than half of them had asthma onset in childhood. Subjects with COPD alone had the highest lifelong exposure to tobacco smoking and occupational inhalants, and they showed accelerated lung function decline during adult life.

The coexistence between asthma and COPD seems to have its origins earlier in life compared to COPD alone. These findings suggest that prevention of this severe condition, which is typical at older ages, should start in childhood.