



## **ARIA-EAACI statement on asthma and COVID-19 (June 2, 2020).**

Jean Bousquet, Marek Jutel, Cezmi A. Akdis, Ludger Klimek, Olivier Pfaar,  
Kari Christine Nadeau, Thomas Eiwegger, Anna Bedbrook, Ignacio Javier  
Ansotegui, Josep M. Anto, et al.

### **► To cite this version:**

Jean Bousquet, Marek Jutel, Cezmi A. Akdis, Ludger Klimek, Olivier Pfaar, et al.. ARIA-EAACI statement on asthma and COVID-19 (June 2, 2020).. Allergy, 2021, 76 (3), pp.689-697. 10.1111/all.14471 . hal-03609496

**HAL Id: hal-03609496**

**<https://hal.science/hal-03609496>**

Submitted on 28 Mar 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



# ARIA-EAACI statement on asthma and COVID-19 (June 2, 2020)

Jean Bousquet<sup>1,2,3,4</sup> | Marek Jutel<sup>5</sup> | Cezmi A. Akdis<sup>6</sup> | Ludger Klimek<sup>7</sup> | Oliver Pfaar<sup>8</sup> | Kari C. Nadeau<sup>9</sup> | Thomas Eiwegger<sup>10</sup> | Anna Bedbrook<sup>4</sup> | Ignacio J. Ansotegui<sup>11</sup> | Josep M. Anto<sup>12,13,14,15</sup> | Claus Bachert<sup>16,17,18,19</sup> | Eric D. Bateman<sup>20</sup> | Kazi S. Bennoor<sup>21</sup> | Elena Camelia Berghea<sup>22,23</sup> | Karl-Christian Bergmann<sup>1,2</sup> | Hubert Blain<sup>24,25</sup> | Mateo Bonini<sup>26,27</sup> | Sinthia Bosnic-Anticevich<sup>28,29</sup> | Louis-Philippe Boulet<sup>30</sup> | Luisa Brussino<sup>31</sup> | Roland Buhl<sup>32</sup> | Paulo Camargos<sup>33</sup> | Giorgio Walter Canonica<sup>34</sup> | Victoria Cardona<sup>35</sup> | Thomas Casale<sup>36</sup> | Sharon Chinthrajah<sup>9</sup> | Mübeccel Akdis<sup>6</sup> | Tomas Chivato<sup>37</sup> | George Christoff<sup>38</sup> | Alvaro A. Cruz<sup>39</sup> | Wienczyslawa Czarlewski<sup>40</sup> | Stefano Del Giacco<sup>41</sup> | Hui Du<sup>42</sup> | Yehia El-Gamal<sup>43</sup> | Wytske J. Fokkens<sup>44,45</sup> | Joao A. Fonseca<sup>46,47,48,49</sup> | Yadong Gao<sup>50</sup> | Mina Gaga<sup>51</sup> | Bilun Gemicioglu<sup>52</sup> | Maia Gotua<sup>53</sup> | Tari Haahtela<sup>54</sup> | David Halpin<sup>55</sup> | Eckard Hamelmann<sup>56</sup> | Karin Hoffmann-Sommergruber<sup>57</sup> | Marc Humbert<sup>58</sup> | Nataliya Ilina<sup>59</sup> | Juan-Carlos Ivancevich<sup>60</sup> | Guy Joos<sup>61</sup> | Musa Khaitov<sup>59</sup> | Bruce Kirenga<sup>62</sup> | Edward F. Knol<sup>63</sup> | Fanny W. Ko<sup>64</sup> | Seppo Koskinen<sup>65</sup> | Marek L. Kowalski<sup>66</sup> | Helga Kraxner<sup>67</sup> | Dmitry Kudlay<sup>59</sup> | Piotr Kuna<sup>68</sup> | Maciej Kupczyk<sup>68</sup> | Violeta Kvedariene<sup>69,70</sup> | Amir H. Abdul Latiff<sup>71</sup> | Lan T. Le<sup>72</sup> | Michael Levin<sup>73</sup> | Desiree Larenas-Linnemann<sup>74</sup> | Renaud Louis<sup>75</sup> | Mohammad R. Masjedi<sup>76</sup> | Erik Melén<sup>77,78</sup> | Florin Mihaltan<sup>79</sup> | Branislava Milenkovic<sup>80</sup> | Yousser Mohammad<sup>81,82</sup> | Mario Morais-Almeida<sup>83</sup> | Joaquim Mullol<sup>84,85</sup> | Leyla Namazova<sup>86,87</sup> | Hugo Neffen<sup>88,89</sup> | Elisabete Nunes<sup>90</sup> | Paul O'Byrne<sup>91,92</sup> | Robyn O'Hehir<sup>93</sup> | Liam O'Mahony<sup>94</sup> | Ken Ohta<sup>95</sup> | Yoshitaka Okamoto<sup>96</sup> | Gabrielle L. Onorato<sup>4</sup> | Petr Panzner<sup>97</sup> | Nikos G. Papadopoulos<sup>98</sup> | Gianni Passalacqua<sup>99</sup> | Vincenzo Patella<sup>100</sup> | Ruby Pawankar<sup>101</sup> | Nhat Phan-Thi<sup>102</sup> | Bernard Pigearias<sup>103</sup> | Todor A. Popov<sup>104</sup> | Francesca Puggioni<sup>34</sup> | Frederico S. Regateiro<sup>105,106,107</sup> | Giovanni Rolla<sup>31</sup> | Menachem Rottem<sup>108,109</sup> | Boleslaw Samolinski<sup>110</sup> | Joaquin Sastre<sup>111</sup> | Jurgen Schwarze<sup>112</sup> | Aziz Sheikh<sup>113</sup> | Nicola Scichilone<sup>114</sup> | Manuel Soto-Quiros<sup>115</sup> | Manuel Soto-Martinez<sup>115</sup> | Milan Sova<sup>116</sup> | Stefania Nicola<sup>117</sup> | Rafael Stelmach<sup>118</sup> | Charlotte Suppli-Ulrik<sup>119</sup> | Luis Taborda-Barata<sup>120,121</sup> |

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2020 The Authors. *Allergy* published by European Academy of Allergy and Clinical Immunology and John Wiley & Sons Ltd

**Teresa To<sup>122</sup>** | **Peter-Valentin Tomazic<sup>123</sup>**  | **Sanna Toppila-Salmi<sup>54</sup>**  |  
**Ioanna Tsiligianni<sup>124,125</sup>** | **Omar Usmani<sup>126</sup>** | **Arunas Valiulis<sup>127,128</sup>** |  
**Maria Teresa Ventura<sup>129</sup>** | **Giovanni Viegi<sup>130,131</sup>** | **Theodor Vontetsianos<sup>132</sup>** |  
**De Yun Wang<sup>133</sup>** | **Sian Williams<sup>134</sup>** | **Gary W. K. Wong<sup>135</sup>**  | **Arzu Yorgancioglu<sup>136</sup>** |  
**Mario Zernotti<sup>137</sup>** | **Mihaela Zidarn<sup>138</sup>** | **Torsten Zuberbier<sup>1,2</sup>**  | **Ioana Agache<sup>139</sup>** 

<sup>1</sup>Charité, Universitätsmedizin Berlin, Humboldt-Universität zu Berlin, Berlin, Germany

<sup>2</sup>Comprehensive Allergy Center, Department of Dermatology and Allergy, Berlin Institute of Health, Berlin, Germany

<sup>3</sup>University Hospital Montpellier, Montpellier, France

<sup>4</sup>MACVIA-France, Montpellier, France

<sup>5</sup>Department of Clinical Immunology, Wrocław Medical University and ALL-MED Medical Research Institute, Wrocław, Poland

<sup>6</sup>Akdis M. Swiss Institute of Allergy and Asthma Research (SIAF), University of Zurich, Davos, Switzerland

<sup>7</sup>Center for Rhinology and Allergology, Wiesbaden, Germany

<sup>8</sup>Section of Rhinology and Allergy, Department of Otorhinolaryngology, Head and Neck Surgery, University Hospital Marburg, Philipps-Universität Marburg, Marburg, Germany

<sup>9</sup>Stanford University School of Medicine, Sean N. Parker Center for Allergy and Asthma Research, Stanford, CA, USA

<sup>10</sup>The Hospital for Sick Children, Department of Paediatrics, Division of Clinical Immunology and Allergy, Food allergy and Anaphylaxis Program, The University of Toronto, Toronto, ON, Canada

<sup>11</sup>Department of Allergy and Immunology, Hospital Quironsalud Bizkaia, Erandio, Spain

<sup>12</sup>Centre for Research in Environmental Epidemiology (CREAL), ISGlobAL, Barcelona, Spain

<sup>13</sup>IMIM (Hospital del Mar Research Institute), Barcelona, Spain

<sup>14</sup>Universitat Pompeu Fabra (UPF), Barcelona, Spain

<sup>15</sup>CIBER Epidemiología y Salud Pública (CIBERESP), Barcelona, Spain

<sup>16</sup>Upper Airways Research Laboratory, ENT Department, Ghent University Hospital, Ghent, Belgium

<sup>17</sup>International Airway Research Center, First Affiliated Hospital Guangzhou, Sun Yat-sen University, Guangzhou, China

<sup>18</sup>Division of ENT Diseases, CLINTEC, Karolinska Institutet, Stockholm, Sweden

<sup>19</sup>Department of ENT Diseases, Karolinska University Hospital, Stockholm, Sweden

<sup>20</sup>Department of Medicine, University of Cape Town, Cape Town, South Africa

<sup>21</sup>Department of Respiratory Medicine, National Institute of Diseases of the Chest and Hospital, Dhaka, Bangladesh

<sup>22</sup>Allergology and Clinical Immunology, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

<sup>23</sup>Clinical Emergency Hospital for Children MS Curie, Bucharest, Romania

<sup>24</sup>Department of Geriatrics, Montpellier University Hospital, Montpellier, France

<sup>25</sup>EA:2991, Euromov, University Montpellier, Montpellier, France

<sup>26</sup>Department of Cardiovascular and Thoracic Sciences, Fondazione Policlinico Universitario A Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy

<sup>27</sup>National Heart and Lung Institute, Royal Brompton Hospital and Imperial College London, London, UK

<sup>28</sup>Woolcock Institute of Medical Research, University of Sydney, Sydney, NSW, Australia

<sup>29</sup>Woolcock Emphysema Centre and Sydney Local Health District, Glebe, NSW, Australia

<sup>30</sup>Quebec Heart and Lung Institute, Laval University, Québec City, QC, Canada

<sup>31</sup>Allergy and Clinical Immunology Unit, Department of Medical Sciences, University of Torino and Mauriziano Hospital, Torino, Italy

<sup>32</sup>Department of Pulmonary Medicine, Mainz University Hospital, Mainz, Germany

<sup>33</sup>Department of Pediatrics, Medical School, Federal University of Minas Gerais, Belo Horizonte, Brazil

<sup>34</sup>Personalized Medicine Asthma and Allergy Clinic-Humanitas University and Research Hospital, IRCCS-Milano, Milano, Italy

<sup>35</sup>Allergy Section, Department of Internal Medicine, Hospital Vall d'Hebron and ARADyAL research network, Barcelona, Spain

<sup>36</sup>Division of Allergy/immunology, University of South Florida, Tampa, FL, USA

<sup>37</sup>School of Medicine, University CEU San Pablo, Madrid, Spain

<sup>38</sup>Faculty of Public Health, Medical University - Sofia, Sofia, Bulgaria

<sup>39</sup>Fundação ProAR, Federal University of Bahia and GARD/WHO Planning Group, Salvador, Brazil

<sup>40</sup>Medical Consulting Czarlewski, Levallois, France

<sup>41</sup>Department of Medical Sciences and Public Health and Unit of Allergy and Clinical Immunology, University Hospital "Dulio Casula", University of Cagliari, Cagliari, Italy

<sup>42</sup>Department of Respiratory Medicine, Wuhan Children's Hospital, Tongji Medical College, Huazhong, University of Science and Technology, Wuhan, Hubei, China

<sup>43</sup>Pediatric Allergy and Immunology Unit, Children's Hospital, Ain Shams University, Cairo, Egypt

- <sup>44</sup>Department of Otorhinolaryngology, Academic Medical Centers, AMC, Amsterdam, The Netherlands
- <sup>45</sup>EUFORIA, Brussels, Belgium
- <sup>46</sup>Center for Research in Health Technologies and Information Systems, CINTESIS, Universidade do Porto, Porto, Portugal
- <sup>47</sup>Allergy Unit, Instituto CUF Porto e Hospital CUF Porto, Porto, Portugal
- <sup>48</sup>Health Information and Decision Sciences Department - CIDES, Faculdade de Medicina, Universidade do Porto, Porto, Portugal
- <sup>49</sup>Faculdade de Medicina da Universidade do Porto, Porto, Portugal
- <sup>50</sup>Department of Allergology, Zhongnan Hospital of Wuhan University, Wuhan, China
- <sup>51</sup>7th Respiratory Medicine Department and Asthma Center, Athens Chest Hospital, Athens, Greece
- <sup>52</sup>Department of Pulmonary Diseases, Cerrahpasa Faculty of Medicine, Istanbul University-Cerrahpasa, Istanbul, Turkey
- <sup>53</sup>Center of Allergy and Immunology, Georgian Association of Allergology and Clinical Immunology, Tbilisi, Georgia
- <sup>54</sup>Skin and Allergy Hospital, Helsinki University Hospital, Helsinki, Finland
- <sup>55</sup>College of Medicine and Health, University of Exeter Medical School, University of Exeter, Exeter, UK
- <sup>56</sup>Klinik für Kinder- und Jugendmedizin, Kinderzentrum Bethel, Evangelisches Klinikum Bethel EvKB, University Bielefeld, Bielefeld, Germany
- <sup>57</sup>Department of Pathophysiology and Allergy Research, Medical University of Vienna, Vienna, Austria
- <sup>58</sup>Service de Pneumologie, Hôpital Bicêtre, Inserm UMR\_S999, Université Paris-Sud, Le Kremlin Bicêtre, France
- <sup>59</sup>National Research Center - Institute of Immunology Federal Medical-Biological Agency of Russia, Moscow, Russia
- <sup>60</sup>Servicio de Alergia e Immunologia, Clínica Santa Isabel, Buenos Aires, Argentina
- <sup>61</sup>Department of Respiratory Medicine, Ghent University Hospital, Ghent, Belgium
- <sup>62</sup>Makerere University Lung Institute, Kampala, Uganda
- <sup>63</sup>Departments of Immunology and Dermatology/Allergology, University Medical Center Utrecht, Utrecht, The Netherlands
- <sup>64</sup>Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong, Hong Kong
- <sup>65</sup>Finnish Institute for Health and Welfare, Helsinki, Finland
- <sup>66</sup>Department of Immunology and Allergy, Healthy Ageing Research Center, Medical University of Lodz, Lodz, Poland
- <sup>67</sup>Department of Otorhinolaryngology, Head and Neck Surgery, Semmelweis University, Budapest, Hungary
- <sup>68</sup>Division of Internal Medicine, Asthma and Allergy, Barlicki University Hospital, Medical University of Lodz, Lodz, Poland
- <sup>69</sup>Department of Pathology, Faculty of Medicine, Institute of Biomedical Sciences, Vilnius University, Vilnius, Lithuania
- <sup>70</sup>Clinic of Chest diseases and Allergology, Faculty of Medicine, Institute of Clinical medicine, Vilnius University, Vilnius, Lithuania
- <sup>71</sup>Allergy and Immunology Centre, Pantai Hospital, Kuala Lumpur, Malaysia
- <sup>72</sup>University of Medicine and Pharmacy, Hochiminh City, Vietnam
- <sup>73</sup>Division Paediatric Allergology, University of Cape Town, Cape Town, South Africa
- <sup>74</sup>Center of Excellence in Asthma and Allergy, Médica Sur Clinical Foundation and Hospital, México City, Mexico
- <sup>75</sup>Department of Pulmonary Medicine, CHU Sart-Tilman, and GIGA I3 Research Group, Liege, Belgium
- <sup>76</sup>Tobacco Control Research Centre, Iranian Anti Tobacco Association, Tehran, Iran
- <sup>77</sup>Sachs' Children and Youth Hospital, Södersjukhuset, Stockholm, Sweden
- <sup>78</sup>Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden
- <sup>79</sup>National Institute of Pneumology M Nasta, Bucharest, Romania
- <sup>80</sup>Clinic for Pulmonary Diseases, Clinical Center of Serbia, Faculty of Medicine, Serbian Association for Asthma and COPD, University of Belgrade, Belgrade, Serbia
- <sup>81</sup>National Center for Research in Chronic Respiratory Diseases, Tishreen University School of Medicine, Latakia, Syria
- <sup>82</sup>Syrian Private University-Damascus, Damas, Syria
- <sup>83</sup>Allergy Center, CUF Descobertas Hospital, Lisbon, Portugal
- <sup>84</sup>Rhinology Unit and Smell Clinic, ENT Department, Hospital Clínic, Barcelona, Spain
- <sup>85</sup>Clinical and Experimental Respiratory Immunoallergy, IDIBAPS, CIBERES, University of Barcelona, Barcelona, Spain
- <sup>86</sup>Scientific Centre of Children's Health Under the MoH, Moscow, Russia
- <sup>87</sup>Russian National Research Medical University Named Pirogov, Moscow, Russia
- <sup>88</sup>Director of Center of Allergy, Immunology and Respiratory Diseases, Santa Fe, Argentina
- <sup>89</sup>Argentina Center for Allergy and Immunology, Santa Fe, Argentina
- <sup>90</sup>Serviço de Pneumologia Hospital Central and Faculdade de Medicina Dr Eduardo Mondelane, Maputo, Mozambique
- <sup>91</sup>Division of Respirology, Department of Medicine, McMaster University, Hamilton, ON, Canada
- <sup>92</sup>Firestone Institute for Respiratory Health, St Joseph's Healthcare, Hamilton, ON, Canada
- <sup>93</sup>Department of Allergy, Immunology and Respiratory Medicine, Central Clinical School, Monash University, and Alfred Health, Melbourne, Vic., Australia
- <sup>94</sup>Departments of Medicine and Microbiology, APC Microbiome Ireland, University College Cork, Cork, Ireland
- <sup>95</sup>National Hospital Organization, Tokyo National Hospital, Tokyo, Japan
- <sup>96</sup>Department of Otorhinolaryngology, Chiba University Hospital, Chiba, Japan

- <sup>97</sup>Department of Immunology and Allergology, Faculty of Medicine and Faculty Hospital in Pilsen, Charles University in Prague, Pilsen, Czech Republic
- <sup>98</sup>Division of Infection, Immunity and Respiratory Medicine, Royal Manchester Children's Hospital, University of Manchester, Manchester, UK
- <sup>99</sup>Allergy and Respiratory Diseases, Ospedale Policlinico San Martino -University of Genoa, Genoa, Italy
- <sup>100</sup>Division of Allergy and Clinical Immunology, Department of Medicine, Agency of Health ASL Salerno, "Santa Maria della Speranza" Hospital, Salerno, Italy
- <sup>101</sup>Department of Pediatrics, Nippon Medical School, Tokyo, Japan
- <sup>102</sup>Ecole Polytechnique Palaiseau, IRBA (Institut de Recherche bio-Médicale des Armées),, Bretigny, France
- <sup>103</sup>Société de Pneumologie de Langue Française, Espace Francophone de Pneumologie, Paris, France
- <sup>104</sup>University Hospital 'Sv Ivan Rilski', Sofia, Bulgaria
- <sup>105</sup>Allergy and Clinical Immunology Unit, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal
- <sup>106</sup>Faculty of Medicine, Institute of Immunology, University of Coimbra, Coimbra, Portugal
- <sup>107</sup>Faculty of Medicine, ICBR - Coimbra Institute for Clinical and Biomedical Research, CIBB, University of Coimbra, Coimbra, Portugal
- <sup>108</sup>Division of Allergy Asthma and Clinical Immunology, Emek Medical Center, Afula, Israel
- <sup>109</sup>Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel
- <sup>110</sup>Department of Prevention of Environmental Hazards and Allergology, Medical University of Warsaw, Warsaw, Poland
- <sup>111</sup>Faculty of Medicine, Fundacion Jimenez Diaz, CIBERES, Autonoma University of Madrid, Madrid, Spain
- <sup>112</sup>Centre for Inflammation Research, Child Life and Health, The University of Edinburgh, Edinburgh, UK
- <sup>113</sup>The Usher Institute of Population Health Sciences and Informatics, The University of Edinburgh, Edinburgh, UK
- <sup>114</sup>PROMISE Department, University of Palermo, Palermo, Italy
- <sup>115</sup>Department of Pediatrics, Hospital Nacional de Niños, San José, Costa Rica
- <sup>116</sup>Department of Respiratory Medicine, University Hospital Olomouc, Olomouc, Czech Republic
- <sup>117</sup>Allergy and Clinical Immunology Unit, Department of Medical Sciences, University of Torino and Mauriziano Hospital, Torino, Italy
- <sup>118</sup>Pulmonary Division, Heart Institute (InCor), Hospital da Clinicas da Faculdade de Medicina da Universidade de Sao Paulo, Sao Paulo, Brazil
- <sup>119</sup>Department of Respiratory Medicine, Hvidovre Hospital and University of Copenhagen, Copenhagen, Denmark
- <sup>120</sup>Faculty of Health Sciences, University of Beira Interior, Covilhã, Portugal
- <sup>121</sup>Department of Immunoallergology, Cova da Beira University Hospital Centre, Covilhã, Portugal
- <sup>122</sup>The Hospital for Sick Children, Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada
- <sup>123</sup>Department of General ORL, H&NS, Medical University of Graz, ENT-University Hospital Graz, Graz, Austria
- <sup>124</sup>Health Planning Unit, Department of Social Medicine, Faculty of Medicine, University of Crete, Crete, Greece
- <sup>125</sup>International Primary Care Respiratory Group International Primary Care Respiratory Group, (IPCRG), Aberdeen, Scotland
- <sup>126</sup>Airways Disease Section, National Heart and Lung Institute (NHLI), Imperial College London and Royal Brompton Hospital, London, UK
- <sup>127</sup>Faculty of Medicine, Institute of Clinical Medicine and Institute of Health Sciences, Vilnius University, Vilnius, Lithuania
- <sup>128</sup>European Academy of Paediatrics (EAP/UEMS-SP), Brussels, Belgium
- <sup>129</sup>Unit of Geriatric Immunoallergology, University of Bari Medical School, Bari, Italy
- <sup>130</sup>Pulmonary Environmental Epidemiology Unit, CNR Institute of Clinical Physiology, Pisa, Italy
- <sup>131</sup>CNR Institute for Biomedical Research and Innovation, Palermo, Italy
- <sup>132</sup>Sotiria Hospital, Athens, Greece
- <sup>133</sup>Department of Otolaryngology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, Singapore
- <sup>134</sup>International Primary Care Respiratory Group IPCRG, Aberdeen, Scotland
- <sup>135</sup>Department of Paediatrics, Prince of Wales Hospital, The Chinese University of Hong Kong, Shatin, Hong Kong
- <sup>136</sup>Department of Pulmonology, Celal Bayar University, Manisa, Turkey
- <sup>137</sup>Universidad Nacional de Villa Maria, Universidad Católica de Córdoba, Córdoba, Argentina
- <sup>138</sup>University Clinic of Respiratory and Allergic Diseases, Golnik, Slovenia
- <sup>139</sup>Transylvania University Brasov, Brasov, Romania

**Correspondence:** Jean Bousquet, CHU Arnaud de Villeneuve, 371 Avenue du Doyen Gaston Giraud, 34295 Montpellier Cedex 5, France.  
Email: jean.bousquet@orange.fr

#### Funding information

ARIA, Grant/Award Number: N/A

To the Editor,

A novel strain of human coronaviruses, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), named by the International Committee on Taxonomy of Viruses (ICTV),<sup>1</sup> has recently emerged and caused an infectious disease. This disease is

referred to as the "coronavirus disease 2019" (COVID-19) by the World Health Organization (WHO).<sup>2</sup>

The US Centers for Disease Control and Prevention (CDC) have proposed that "People with moderate to severe asthma may be at higher risk of getting very sick from COVID-19. COVID-19 can affect

your respiratory tract (nose, throat, lungs), cause an asthma attack and possibly lead to pneumonia and acute respiratory disease.” (May 24, 2020). (<https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/asthma.html>) On the other hand, in the UK, NICE proposes rapid guidelines for severe asthma (<https://www.guidelines.co.uk/covid-19-rapid-guideline-severe-asthma/455275>. article).

An ARIA-EAACI statement has been devised to make recommendations on asthma, and not necessarily on severe asthma, based on a consensus from its members.

It is difficult in many studies to clearly assess the prevalence of asthma on COVID-19 since most patients are older adults and probably have multimorbidities. Most studies do not clarify whether asthmatic patients with COVID-19 have isolated asthma or asthma as a multimorbidity, particularly in the context of hypertension, obesity and diabetes. In particular, obesity is a significant risk factor for COVID-19 and its severity,<sup>3</sup> and may be intertwined with asthma.

In some studies, showing data mostly on critically ill patients, there does not appear to be an increased prevalence of asthma.<sup>4-7</sup> In Wuhan, the prevalence of asthma in COVID-19 patients was 0.9%, markedly lower than that of the general adult population of this city.<sup>8</sup> Differently, in New York, among 5,700 hospitalized patients with COVID-19, asthma prevalence was 9% and COPD 4.5%.<sup>9</sup> In California, 7.4% of the 377 hospitalized patients had asthma or COPD.<sup>10</sup> The US CDC reported that between March 1st and 30th 2020, among COVID-NET hospitals from 99 counties and 14 states (an open source neural network for COVID-19 infection), chronic lung disease (primarily asthma) was the second most prevalent comorbid condition for hospitalized patients aged 18-49 years with laboratory-confirmed COVID-19.<sup>11</sup> Among the 17% of COVID-19-positive patients with an underlying history of asthma, the incidence was at its highest in younger adults (27% in the 18- to 49-year-old group). The UK experience on over 20, 133 hospitalized cases shows that 14% of admissions were patients with asthma.<sup>12</sup> In the OpenSAFELY Collaborative Study (UK), an increased risk of severe COVID-19, including death, was found in patients with asthma, particularly related with a recent use of oral corticosteroid.<sup>13</sup> A review with all identified studies up to 5 May 2020 is available.<sup>14</sup> However, low socioeconomic status, obesity, non-white ethnicity, chronic respiratory disease and diabetes had stronger signals.

Some anti-asthma medications, such as ciclesonide, might have a beneficial effect on COVID-19.<sup>15</sup>

Thus, whether patients with asthma are at a higher or lower risk of acquiring COVID-19 may depend on geography, age, other multimorbidities, different air quality,<sup>16</sup> genetic predispositions, ethnicity, social behaviour, access to health care or other factors. Moreover, the current information is obtained mainly from hospitalization or intensive care unit data. Real-life data in a non-selected population of asthmatics are needed to better understand the links between asthma and SARS-Cov-2 in terms of both incidence and severity.

Asthma does not seem to be a risk factor for severe COVID-19 but patients treated with oral corticosteroids may be at a higher risk

of severe COVID-19.<sup>14</sup> However, a large study is needed to fully appreciate the relationship between COVID-19 and severe asthma.

According to the IPCRG (International Primary Care Respiratory Group), patients are still struggling to differentiate their symptoms between asthma flare-ups and COVID-19. They may therefore delay seeking care for asthma or COVID-19. Interestingly, clarity does not appear to have improved as the weeks have passed. People have recurrences or waves of repeated symptoms, and it is difficult to understand whether the symptoms are related to an asthma exacerbation or to COVID-19.

According to the IPCRG, many clinicians tend to prescribe antibiotics to people who they believe are having asthma exacerbations “just to be safe.” They focus on the potential infection element of the trigger more than the asthma management itself. It would seem that COVID-19 might exacerbate this behaviour, not improve it.

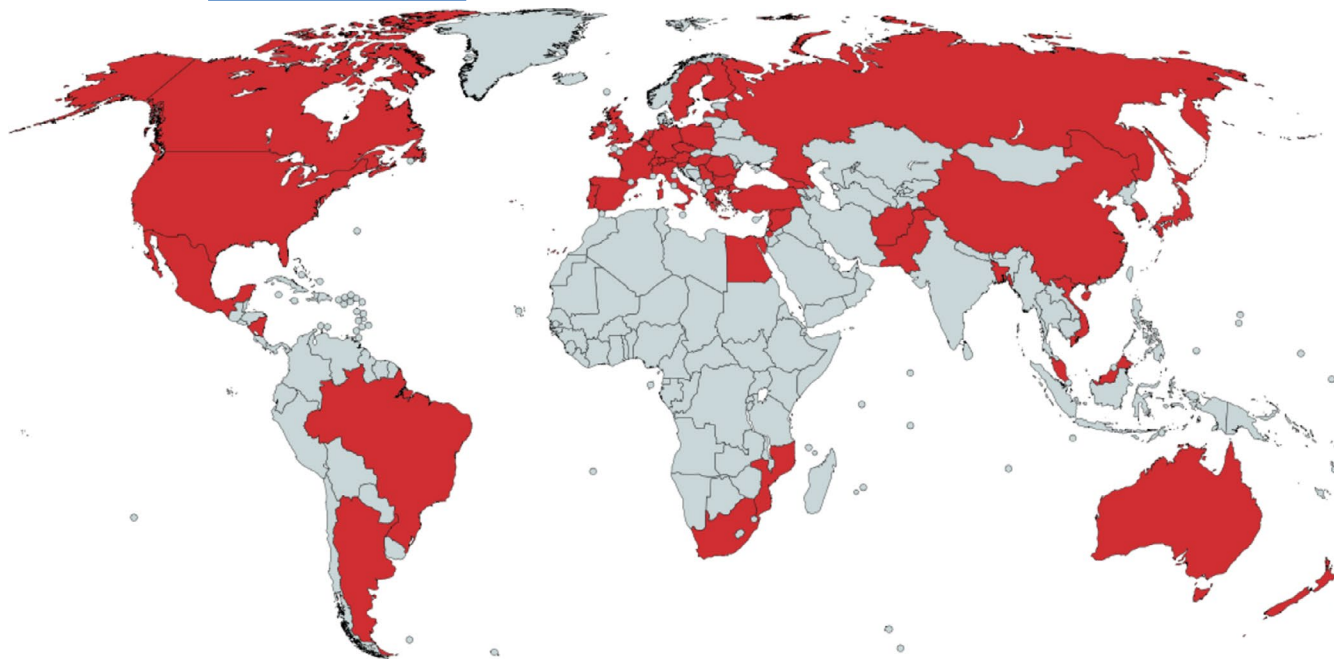
In areas where COVID-19 is prevalent, GPs are still very concerned about oral—and, to a certain degree, inhaled—corticosteroids, possibly because they use remote models of care. They are reluctant to prescribe higher doses of ICS or OCS as they fear they cannot tell the difference between a flare-up and COVID-19.

The extent of expression in the upper and lower airways of the SARS-CoV-2 entry receptors, angiotensin-converting enzyme 2 (ACE2) and TMPRSS2, might impact the clinical severity of COVID-19. ACE-2 was found to be decreased in patients with allergic asthma<sup>17</sup> or in those receiving inhaled corticosteroids.<sup>18</sup> These data suggest that this expression may be a potential contributor, among several other factors, to reduced COVID-19 severity in patients with T2 inflammation.<sup>17,19</sup> However, ACE-2 expression in asthma patients was increased in African Americans, in males and in association with diabetes.

Finally, a recent study which analysed the nasal transcriptome of 695 children suggested that the strongest determinants of airway ACE2 and TMPRSS2 expression are T2 inflammation and viral-induced interferon inflammation. However, this study specifically showed that T2 inflammation (via IL-13) impacted differentially on ACE2 and TMPRSS2, with a T2-high phenotype being associated with a highly significant decrease in the former and a significant decrease in the latter receptor. Thus, although SARS-CoV-2-specific analyses and experiments are lacking, the differential effects of T2-inflammation on ACE2 and TMPRSS2 reported in this study warrant further research on whether T2-high and T2-low asthma phenotypes may be associated with differential susceptibility to severe COVID-19.

The first author developed seven recommendations that were sent for comment to 105 experts around the world. 69 answers were received within 48 hours, and the comments were considered. Where experts suggested modification of the recommendations, a discussion was initiated and recommendations modified until consensus was reached. After these modifications, a total of 9 recommendations were proposed for a second round. In the second round, 145 experts were invited to comment on and approve or reject the recommendations. 78 answers were received within 48 hours and, when an agreement of over 80/100 was reached, the question was included in the statement.





**FIGURE 1** Geographic representation of the experts

The same approach was used for the research questions. Two research needs were dropped.

The geographic distribution of the experts is given in Figure 1. They were from 43 countries.

ARIA-EAACI statement (Table 1).

ARIA-EAACI research questions (Table 2).

This view is pragmatic, cautious and based upon expert opinion. However, it is likely to require modifications as further evidence is

- 1 In areas where COVID-19 is prevalent, screening protocols for COVID-19 should be applied to anyone having worsening respiratory symptoms, and personal protective equipment should be used.
- 2 In areas where COVID-19 is prevalent, lung function testing procedures should be postponed if not deemed absolutely necessary; portable personal devices measuring PEF and FEV1 can be used in the meantime to monitor asthma control using the telemedicine approach.
- 3 In accordance with the Global Initiative for Asthma (GINA) (<https://ginasthma.org/recommendations-for-inhaled-asthma-controller-medications/>), patients with asthma should not stop their prescribed inhaled corticosteroid controller medication (or prescribed oral corticosteroids). Stopping inhaled corticosteroids may have serious consequences.
- 4 Long-term oral corticosteroids may sometimes be required to treat severe asthma, and it may be dangerous to stop them suddenly (GINA).
- 5 Oral steroids should continue to be used to treat severe asthma exacerbations.
- 6 In patients infected by SARS-CoV-2 (symptomatic or asymptomatic), nebulization (which increases the risk of deposition of the virus into the lower airways) should be replaced by spacers of large capacity.
- 7 In accordance with the NICE, in non-SARS-CoV-2 infected patients, we propose(<https://www.nice.org.uk/guidance/ng166/chapter/3-Treatment#patients-having-biological-treatment>):
  - To continue biologics because there is no evidence that biological therapies for asthma suppress immunity
  - If the patient usually attends a hospital for biological treatments, to think about if he/she can be trained to self-administer or could be treated at a community clinic or at home
  - To carry out routine monitoring of biological treatment remotely if possible
- 8 In SARS-CoV-2-infected patients, in accordance with the EAACI, we propose to cease the treatment until resolution of the disease is established. Thereafter, the administration of the biological should be re-initiated.

**TABLE 1** ARIA-EAACI statement

TABLE 2 ARIA-EAACI research questions

## Real-world studies need to be carried out on a large number of unselected patients to assess

- 1 Impact of COVID-19 on asthma control
- 2 Impact of COVID-19 respiratory symptoms on severe asthma
- 3 Impact of severe asthma on COVID-19 occurrence and/or severity of pneumonia
- 4 Impact of multimorbidities on asthmatic patients for the control of asthma during COVID-19
- 5 Serologic studies should be performed to assess whether seroconversion and its duration differ in asthmatic and non-asthmatic subjects
- 6 The phenotype of asthma (allergic, neutrophilic, age....) should be studied
- 7 In adult patients, studies should clarify whether asthmatic patients with COVID-19 have isolated asthma or asthma in the context of multimorbidity, particularly in the context of high blood pressure, obesity and diabetes mellitus
- 8 Role of pollen season on COVID-19 severity

gathered. These recommendations are conditional and should be adapted regularly on the basis of evolving clinical evidence.

## ACKNOWLEDGMENT

Open access funding enabled and organized by Projekt DEAL.

## CONFLICTS OF INTEREST

IA reports and Associate Editor of Allergy. CA reports grants from Allergopharma, Idorsia, Swiss National Science Foundation, Christine Kühne-Center for Allergy Research and Education, European Commission's Horizon's 2020 Framework Programme, Cure, Novartis Research Institutes, Astra Zeneca, Scibase, advisory role in Sanofi/Regeneron. IA reports personal fees from Mundipharma, Roxall, Sanofi, MSD, Faes Farma, Hikma, UCB, Astra Zeneca, Stallergenes, Abbott, Bial. EB is a member of the Science Committee and Board of the Global Initiative for Asthma (GINA). SBA reports grants from TEVA, personal fees from TEVA, AstraZeneca, Boehringer Ingelheim, GSK, Sanofi, Mylan. JPB reports grants from AstraZeneca, Boston Scientific, GSK, Hoffman La Roche, Ono Pharma, Novartis, Sanofi, Takeda, Boehringer-Ingelheim, Merck, personal fees from AstraZeneca, GSK, Merck, Metapharm, Novartis, Takeda, other from AstraZeneca, Boehringer-Ingelheim, GSK, Merck, Novartis. JB reports personal fees from Chiesi, Cipla, Hikma, Menarini, Mundipharma, Mylan, Novartis, Purina, Sanofi-Aventis, Takeda, Teva, Uriach, other from KYomed-Innov. RB reports grants to Mainz University and personal fees from Boehringer Ingelheim, GlaxoSmithKline, Novartis, and Roche, as well as personal fees from AstraZeneca, Chiesi, Cipla, Sanofi, and Teva. VC reports personal fees from ALK, Allergopharma, Allergy Therapeutics, Diater, LETI, Thermo Fisher, Stallergenes. RSC reports grants from NIAID, CoFAR, Aimmune, DBV Technologies, Astellas, Regeneron, an Advisory member for Alladapt, Genentech, Novartis, and receives personal fees from Before Brands. AC reports grants and personal fees from GSK, SANOFI, Boehringer-Ingelheim, Astrazeneca, Mantecorp, MYLAN, Novartis, personal fees and non-financial support from CHIESI. SdG reports personal fees from AstraZeneca, Chiesi, Menarini, grants and personal fees from GSK, Novartis. DH reports personal fees from AstraZeneca, Chiesi, GSK, Pfizer, personal fees

and non-financial support from Boehringer Ingelheim, Novartis. TE reports other from DBV, Regeneron, grants from Innovation fund Denmark and Co-I or scientific lead in three investigator initiated oral immunotherapy trials supported by the Allergy and Anaphylaxis Program Sickkids and serve as associate editor for Allergy. Advisory board ALK. JF reports personal fees from AstraZeneca, GSK, undipharma, grants and personal fees from Novartis. MG reports grants and personal fees from Elpen, Novartis, Menarini, grants from Galapagos, personal fees from BMS, MSD. TH reports personal fees from GSK, Mundipharma, OrionPharma. MH reports personal fees and non-financial support from GlaxoSmithKline, personal fees from Astrazeneca, Novartis, Roche, Sanofi, Teva. JCI reports personal fees from Faes Farma, Eurofarma Argentina, other from Laboratorios Casasco, Sanofi. GJ reports grants from AstraZeneca, Chiesi, personal fees from Bayer, Eureka vzw, Teva, grants and personal fees from GlaxoSmithKline. MJ reports personal fees from ALK-Abello, Allergopharma, Stallergenes, Anergis, Allergy Therapeutics, Circassia, Leti, Biomay, from HAL, Astra-Zeneca, GSK, Novartis, Teva, Vectura, UCB, Takeda, Roche, Janssen, Medimmune, Chiesi, LK reports grants and personal fees from Allergopharma, LETI Pharma, MEDA/Mylan, Sanofi, personal fees from HAL Allergie, Allergy Therapeut., grants from ALK Abelló, Stallergenes, Quintiles, ASIT biotech, grants from Lofarma, AstraZeneca, GSK, Immunotk and Membership: AeDA, DGHNO, Deutsche Akademie für Allergologie und klinische Immunologie, HNO-BV GPA, EAACI. PK reports personal fees from Astra, Boehringer Ingelheim, Berlin Chemie Menarini, GSK, Lekam, Novartis, Polpharma, Mylan, Orion, Teva, Adamed. VK reports personal fees from GSK, non-financial support from StallergenGreer, AstraZeneca, Norameda, DIMUNA. DLL reports personal fees from Allakos, Armstrong, Astrazeneca, Boehringer Ingelheim, Chiesi, DBV Technologies, Grunenthal, GSK, MEDA, Menarini, MSD, Novartis, Pfizer, Novartis, Sanofi, Siegfried, UCB, Alakos, Gossamer, grants from Sanofi, Astrazeneca, Novartis, UCB, GSK, TEVA, Boehringer Ingelheim, Chiesi, Purina institute. RL reports grants and personal fees from AZ, GSK, Novartis, grants from Chiesi, JM reports personal fees and other from SANOFI-GENZYME & REGENERON, NOVARTIS, ALLAKOS, grants and personal fees from MYLAN Pharma, URIACH Group, personal fees from



Mitsubishi-Tanabe, Menarini, UCB, AstraZeneca, GSK, from MSD, outside the submitted work. KN reports grants and other from NIAID, FARE, personal fees and other from Regeneron, grants from EAT, other from Sanofi, Astellas, Nestle, BeforeBrands, Alladapt, ForTra, Genentech, Almmune Therapeutics, DBV Technologies, personal fees from Astrazeneca, ImmuneWorks, Cour Pharmaceuticals, grants from Allergenics, Ukko Pharma, Novartis, AnaptysBio, Adare Pharmaceuticals, Stallergenes-Greer, NHLBI, NIEHS, EPA, WAO Center of Excellence, Iggenix, Probio, Vedanta, Centecor, Seed, Immune Tolerance Network, NIH.; In addition, Dr Nadeau has a patent Inhibition of Allergic Reaction to Peanut Allergen using an IL-33 Inhibitor pending, a patent Special Oral Formula for Decreasing Food Allergy Risk and Treatment for Food Allergy pending, a patent Basophil Activation Based Diagnostic Allergy Test pending, a patent Granulocyte-based methods for detecting and monitoring immune system disorders pending, a patent Methods and Assays for Detecting and Quantifying Pure Subpopulations of White Blood Cells in Immune System Disorders pending, a patent Mixed Allergen Compositions and Methods for Using the Same pending, and a patent Microfluidic Device and Diagnostic Methods for Allergy Testing Based on Detection of Basophil Activation pending. YO reports personal fees from Shionogi Co., Ltd., Torii Co., Ltd., GSK, MSD, Eisai Co., Ltd., grants and personal fees from Kyorin Co., Ltd., Tiho Co., Ltd., grants from Yakuruto Co., Ltd., Yamada Bee Farm. ROB reports grants and personal fees from AstraZeneca, GSK, grants from Novartis, Medimmune, Bayer. YO reports personal fees from Shionogi Co., Ltd., Torii Co., Ltd., GSK, MSD, Eisai Co., Ltd., grants and personal fees from Kyorin Co., Ltd., Tiho Co., Ltd., grants from Yakuruto Co., Ltd., Yamada Bee Farm, outside the submitted work. NP reports personal fees from Novartis, Nutricia, HAL, MENARINI/FAES FARMA, SANOFI, MYLAN/MEDA, BIOMAY, AstraZeneca, GSK, MSD, ASIT BIOTECH, Boehringer Ingelheim, grants from Gerolymatos International SA, Capricare. OP reports grants and personal fees from Anergis SA, ALK-Abelló, Allergopharma, Stallergenes Greer, HAL Allergy Holding BV/HAL Allergie GmbH, Bencard Allergie GmbH/Allergy Therapeutics, Lofarma, ASIT Biotech Tools SA, Laboratorios LETI/LETI Pharma, grants from Biomay, Glaxo Smith Kline Circassia, personal fees from MEDA Pharma/MYLAN, Mobile Chamber Experts (a GA<sup>2</sup>LEN Partner), Indoor Biotechnologies, Astellas Pharma Global, EUFOREA, ROXALL, NOVARTIS, SANOFI AVENTIS, Med Update Europe GmbH, streamedup! GmbH. FP reports sanofi, novartis, teva, astrazeneca, glaxosmithkline, menarini, mundipharma, guidotti, malesci, chiesi, valeas, allergy therapeutics, almirall, personal fees from boehringer Ingelheim. FR reports personal fees from AstraZeneca, Novartis, Lusomedicamenta, Sanofi, GSK. JS reports other from MEDA, grants and personal fees from SANOFI, personal fees from GSK, NOVARTIS, ASTRA ZENACA, MUNDIPHARMA, FAES FARMA. JSchwarze reports personal fees from MYLAN, outside the submitted work. ASheikh reports support of the Asthma UK Centre for Applied Research. RS reports grants from São Paulo Research Foundation, MSD, grants and personal fees from Novartis, grants, personal fees and non-financial support from

AstraZeneca, Chiesi, Boehringer Ingelheim. IT reports grants from GSK Hellas, ELPEN, personal fees from Boehringer Ingelheim, Novartis, Astra Zeneca, GSK. TZ reports Organizational affiliations: Committee member: WHO-Initiative "Allergic Rhinitis and Its Impact on Asthma" (ARIA); Member of the Board: German Society for Allergy and Clinical Immunology (DGAKI); Head: European Centre for Allergy Research Foundation (ECARF); President: Global Allergy and Asthma European Network (GA<sup>2</sup>LEN); Member: Committee on Allergy Diagnosis and Molecular Allergology, World Allergy Organization (WAO). The other authors have no COI to declare.

## ORCID

Cezmi A. Akdis  <https://orcid.org/0000-0001-8020-019X>  
 Oliver Pfaar  <https://orcid.org/0000-0003-4374-9639>  
 Kari C. Nadeau  <https://orcid.org/0000-0002-2146-2955>  
 Thomas Eiwegger  <https://orcid.org/0000-0002-2914-7829>  
 Claus Bachert  <https://orcid.org/0000-0003-4742-1665>  
 Karl-Christian Bergmann  <https://orcid.org/0000-0002-0306-9922>  
 Mateo Bonini  <https://orcid.org/0000-0002-3042-0765>  
 Louis-Philippe Boulet  <https://orcid.org/0000-0003-3485-9393>  
 Victoria Cardona  <https://orcid.org/0000-0003-2197-9767>  
 Thomas Casale  <https://orcid.org/0000-0002-3149-7377>  
 Mübeccel Akdis  <https://orcid.org/0000-0003-0554-9943>  
 Alvaro A. Cruz  <https://orcid.org/0000-0002-7403-3871>  
 Wytse J. Fokkens  <https://orcid.org/0000-0003-4852-229X>  
 Maia Gotua  <https://orcid.org/0000-0003-2497-4128>  
 Tari Haahtela  <https://orcid.org/0000-0003-4757-2156>  
 Eckard Hamelmann  <https://orcid.org/0000-0002-2996-8248>  
 Dmitry Kudlay  <https://orcid.org/0000-0003-1878-4467>  
 Michael Levin  <https://orcid.org/0000-0003-2439-7981>  
 Desiree Larenas-Linnemann  <https://orcid.org/0000-0002-5713-5331>  
 Mario Morais-Almeida  <https://orcid.org/0000-0003-1837-2980>  
 Ken Ohta  <https://orcid.org/0000-0001-9734-4579>  
 Nikos G. Papadopoulos  <https://orcid.org/0000-0002-4448-3468>  
 Gianni Passalacqua  <https://orcid.org/0000-0002-5139-3604>  
 Vincenzo Patella  <https://orcid.org/0000-0001-5640-6446>  
 Joaquin Sastre  <https://orcid.org/0000-0003-4689-6837>  
 Peter-Valentin Tomazic  <https://orcid.org/0000-0001-6445-4800>  
 Sanna Toppila-Salmi  <https://orcid.org/0000-0003-0890-6686>  
 Gary W. K. Wong  <https://orcid.org/0000-0001-5939-812X>  
 Torsten Zuberbier  <https://orcid.org/0000-0002-1466-8875>  
 Ioana Agache  <https://orcid.org/0000-0001-7994-364X>

## REFERENCES

1. Coronaviridae Study Group of the International Committee on Taxonomy of Viruses. The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. *Nat Microbiol*. 2020;5: 536–544.
2. Bousquet J, Akdis C, Jutel M, et al. Intranasal corticosteroids in allergic rhinitis in COVID-19 infected patients: An ARIA-EAACI statement. *Allergy*. 2020;75:2440–2444. <https://doi.org/10.1111/all.14302>

3. Wadhera RK, Wadhera P, Gaba P, et al. Variation in COVID-19 hospitalizations and deaths across New York City boroughs. *JAMA*. 2020;323(21):2192.
4. Grasselli G, Zangrillo A, Zanella A, et al. Baseline characteristics and outcomes of 1591 patients infected with SARS-CoV-2 admitted to ICUs of the Lombardy Region, Italy. *JAMA*. 2020;323(16):1574.
5. Zhao Q, Meng M, Kumar R, et al. The impact of COPD and smoking history on the severity of Covid-19: a systemic review and meta-analysis. *J Med Virol*. 2020. <https://doi.org/10.1002/jmv.25889>
6. Zhang JJ, Cao YY, Dong X, et al. Distinct characteristics of COVID-19 patients with initial rRT-PCR-positive and rRT-PCR-negative results for SARS-CoV-2. *Allergy*. 2020;75:1809–1812. <https://doi.org/10.1111/all.14316>
7. Dong X, Cao YY, Lu XX, et al. Eleven Faces of Coronavirus Disease 2019. *Allergy*. 2020;75:1699–1709. <https://doi.org/10.1111/all.14289>
8. Li X, Xu S, Yu M, et al. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. *J Allergy Clin Immunol*. 2020. <https://doi.org/10.1016/j.jaci.2020.04.006>
9. Richardson S, Hirsch JS, Narasimhan M, et al. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized With COVID-19 in the New York City area. *JAMA*. 2020;323(20):2052–2059.
10. Parodi SM, Liu VX. From Containment to Mitigation of COVID-19 in the US. *JAMA*. 2020;323(15):1441.
11. Garg S, Kim L, Whitaker M, et al. Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 - COVID-NET, 14 States, March 1–30, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(15):458–464.
12. Docherty A, Harrison E, Green C, et al. Features of 16,749 hospitalised UK patients with COVID-19 using the ISARIC WHO Clinical Characterisation Protocol. <https://doi.org/10.1101/2020.04.23.20076042>
13. Collaborative TO, Williamson E, Walker A, et al. OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients. *MedRxiv*. 2020. <https://doi.org/10.1101/2020.05.06.20092999>. <https://www.medrxiv.org/content/10.1101/2020.04.23.20076042v1.full.pdf>
14. Morais-Almeida M, Pit  H, Aguiar R, Ansotegui I, Bousquet J. Asthma and the COVID-19 pandemic: literature review. *Int Allergy Immunol*. 2020; <https://doi.org/10.1159/000509057>
15. Jeon S, Ko M, Lee J, et al. Identification of antiviral drug candidates against SARS-CoV-2 from FDA-approved drugs. *Antimicrob Agents Chemother*. 2020. <https://doi.org/10.1128/AAC.00819-20>
16. Wu X, Nethery R, Sabath B, Braun D, Dominici F. Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study. *medRxiv* and *BioRxiv*. 2020. <https://www.medrxiv.org/content/10.1101/2020.04.05.20054502v2>
17. Jackson D, Busse W, Bacharier L, et al. Association of respiratory allergy, asthma and expression of the SARS-CoV-2 receptor, ACE2. *J Allergy Clin Immunol*. 2020; <https://doi.org/10.1164/rccm.202003-0821OC>
18. Peters MC, Sajuthi S, Deford P, et al. COVID-19 related genes in sputum cells in asthma: relationship to demographic features and corticosteroids. *Am J Respir Crit Care Med*. 2020. <https://doi.org/10.1164/rccm.202003-0821OC>
19. Sajuthi S, DeFord P, Jackson N, et al. Type 2 and interferon inflammation strongly regulate SARS-CoV-2 related gene expression in the airway epithelium. *bioRxiv*. 2020. <https://doi.org/10.1101/2020.04.09.034454>

**How to cite this article:** Bousquet J, Jutel M, Akdis CA, et al. ARIA-EAACI statement on asthma and COVID-19 (June 2, 2020). *Allergy*. 2021;76:689–697. <https://doi.org/10.1111/all.14471>