

## Scaling up strategies of the Chronic Respiratory Disease programme of the European Innovation Partnership on Active and Healthy Ageing (Action Plan B3 – Area 5

J Bousquet J (1-3), J Farrell (4), G Crooks (5), P Hellings (6, 7), EH Bel (8, 9), M Bewick (10), NH Chavannes (11-13), J Correia de Sousa (14), AA Cruz (12, 15), T Haahtela, (16, 17), G Joos (18), N Khaltayev (12), J Malva (19), A Muraro (7, 20), M Nogues (21), S Palkonen (22), S Pedersen (23), C Robalo-Cordeiro (24), B Samolinski (25), T Strandberg (26, 27), A Valiulis (28, 29), A Yorgancioglu (12, 16, 30, 31), T Zuberbier (32), A Bedbrook (2), W Aberer (33), M Adachi (34), A Agusti (35), CA Akdis (36), M Akdis (36), J Ankri (3), A Alonso (35), I Annesi-Maesano (37), IJ Ansotegui (38), JM Anto (39-42), S Arnavielhe (43), H Arshad (44), C Bai (45), , I Baiardini (46), C Bachert (47), AK Baigenzhin (48), C Barbara (49), ED Bateman (50), B Beghé (51), A Ben Kheder (52), KS Bennoor (53), M Benson (54), KC Bergmann (32), T Bieber (55), C Bindslev-Jensen (56), Bjermer (57), H Blain (58, 59), F Blasi F (60), AL Boner (61), M Bonini (62), S Bonini (63), S Bosnic-Anticevitch (64), LP Boulet (65), R Bourret (66), PJ Bousquet (37), F Braido (46), AH Briggs (67), CE Brightling (68), J Brozek (69), R Buhl (70), PG Burney (71), A Bush (72), F Caballero-Fonseca (73), D Caimmi (74), MA Calderon (75), PM Calverley (76), PAM Camargos (77), GW Canonica (46), T Camuzat (78), KH Carlsen (79), W Carr (80), A Carriazo (81), T Casale (82), AM Cepeda Sarabia (83), L Chatzi (84), YZ Chen (85), R Chiron (74), E Chkhartishvili (86), AG Chuchalin (87), KF Chung (88), G Ciprandi (89), I Cirule (90), L Cox (91), DJ Costa (2)(11), A Custovic (92), R Dahl (56), SE Dahlen (93), U Darsow (94), G De Carlo (22), F De Blay (95), T Dedeu (96), D Deleanu (97), E De Manuel Keenoy (98), P Demoly (37, 74), JA Denburg (99), P Devillier (100), A Didier (101), AT Dinh-Xuan (102), R Djukanovic (103), D Dokic (104), H Douagui (105), G Dray (106), R Dubakiene (107), SR Durham (108), MS Dykewicz (109), Y El-Gamal (110), R Emuzyte (111), LM Fabbri L (112), M Fletcher (113), A Fiocchi (114), A Fink Wagner (115), J Fonseca (116), WJ Fokkens (117), F Forastiere (118), P Frith (119), M Gaga M (120), A Gamkrelidze (121), J Garces (122), J Garcia-Aymerich (39-42), B Gemicioğlu (123), JE Gereda (124), S González Diaz (125), M Gotua (126), I Grisle (127), L Grouse (128), Z Gutter (129), MA Guzmán (130), LG Heaney (131), B Hellquist-Dahl (132), D Henderson (5), A Hendry (133), J Heinrich (134), D Heve (2, 135), F Horak (136), JO'B Hourihane (137), P Howarth (138), M Humbert (139), ME Hyland (140), M Illario (141), JC Ivancevich (142), JR Jardim (143), E J Jares (144), C Jeandel (2, 58), C Jenkins (145), SL Johnston (146), O Jonquet (147), K Julge (148), KS Jung (149), J Just (150), I Kaidashev (151), MR Kaitov (152), O Kalayci (153), AF Kalyoncu (154), T Keil (155), PK Keith (156), L Klimek (157), B Koffi N'Goran (158), V Kolek (159), GH Koppelman (160), ML Kowalski (161), I Kull (162), P Kuna (163), V Kvedariene (164), B Lambrecht (165), S Lau (166), D Larenas-Linnemann (167), D Laune (43), LTT Le (168), P Lieberman (169), B Lipworth (170), J Li (171), K Lodrup Carlsen (172), R Louis (173), W MacNee (174), Y Magard (175), A Magnan (176), B Mahboub (177), A Mair (178), I Majer (179), MJ Makela (17), P Manning (180), S Mara (181), GD Marshall (182), MR Masjedi (183), P Matignon (184), M Maurer (185), S Mavale-Manuel (186), E Melén (187), E Melo-Gomes (188), EO Meltzer (189), A Menzies-Gow (190), H Merk (191), JP Michel (27), N Miculinic (192), F Mihaltan (193), B Milenkovic (194), G Moda Y Mohammad (195), M Molimard (196), I Momas (197, 198), A. Montilla-Santana (199), M Morais-Almeida (200), M Morgan (201), R Mösges (202), J Mullol (203), (162), S Nafti S (204), L Namazova-Baranova (205), R Naclerio (206), A Neou (32), H Neffen (207), K Nekam (208), B Niggemann (209), G Ninot (210), TD Nyembue (211), RE O'Hehir (212), K Ohta (213), Y Okamoto (214), K Okubo (215), S Ouedraogo (216), P Paggiaro (217), I Pali-Schöll (218), P Panzner (219), N Papadopoulos (220), A Papi (221), HS Park (222), G Passalacqua (46), I Pavord (223), R Pawankar (224), R Pengelly (225), O Pfaar (226), R Picard (227), B Pigearias (158), I Pin (228), D Plavec (229), D Poethig (230), W Pohl (231), TA Popov (232), F Portejoie (2), P Potter (233), D Postma (234), D Price (235), KF Rabe (236), F Raciborski (25), F Radier Pontal (237), S Repka-Ramirez (238), S Reitamo (17), Rennard S (239), F Rodenas (122), Roberts J (240), Roca J (241), L Rodriguez Mañas (242), C Rolland (243), M Roman Rodriguez (244), A Romano (245), J Rosado-Pinto (246), N. Rosario (247), L Rosenwasser (248), M Rottem (249), D Ryan (250), M Sanchez-Borges (251), GK Scadding (252), HJ Schunemann (69), E Serrano (253), P Schmid-

Grendelmeier (254), H Schulz (255), A Sheikh (256), M Shields (257), N Siafakas (258), Y Sibille (259), Similowski T (260), FER Simons (261), JC Sisul (262), I Skrindo (172), HA Smit (263), D Solé (264), T Sooronbaev (265), O Spranger (115), R Stelmach (266), PJ Sterk (267), J Sunyer (39-42), C Thijs (268), T To (269), A Todo-Bom (270), M Triggiani (271), R Valenta (272), AL Valero (273), E Valia (122), E Valovirta (274), Van Ganse E (275), M van Hage (276), O Vandenplas (277), T Vasankari (278), B Vellas (279), Vestbo J (280), G Vezzani (281), P Vichyanond (282), G Viegi (283), C Vogelmeier (284), Vontetsianos T (285), M Wagenmann (286), Wallaert B (287), S Walker (288), DY Wang (289), U Wahn (209), M Wickman (187), DM Williams (290), S Williams (13), J Wright (291), BP Yawn (292), PK Yiallourous (293), OM Yusuf (294), A Zaidi (295), HJ Zar (296), ME Zernotti (297) L Zhang (298), N Zhong (171), M Zidarn (299), J Mercier (300).

1. University Hospital, Montpellier, France
2. MACVIA-LR, Contre les MALadies Chronique pour un Vieillissement Actif en Languedoc Roussillon, European Innovation Partnership on Active and Healthy Ageing Reference Site, France
3. INSERM, VIMA : Ageing and chronic diseases. Epidemiological and public health approaches, U1168, Paris, and UVSQ, UMR-S 1168, Université Versailles St-Quentin-en-Yvelines, France
4. Department of Health, Social Services and Public Safety
5. EIP on AHA, European Innovation Partnership on Active and Healthy Ageing, Reference Site, Scottish Centre for Telehealth and Telecare, NHS 24, Glasgow, UK.
6. Laboratory of Clinical Immunology, Department of Microbiology and Immunology, KU Leuven, Leuven, Belgium
7. European Academy of Allergy and Clinical Immunology
8. Department of Respiratory Medicine, Academic Medical Center (AMC), University of Amsterdam, The Netherlands
9. European Respiratory Society
10. iQ4U Consultants Ltd, London, UK
11. Department of Public Health and Primary Care, Leiden University Medical Center, Leiden, The Netherlands
12. Global Alliance against Chronic Respiratory Diseases (GARD)
13. International Primary Care Respiratory Group
14. Life and Health Sciences Research Institute, ICVS, School of Health Sciences, University of Minho, Braga, Portugal
15. ProAR – Nucleo de Excelencia em Asma, Federal University of Bahia, Brasil and GARD Executive Committee
16. EIP on AHA Commitment for Action
17. Skin and Allergy Hospital, Helsinki University Hospital, Helsinki, Finland
18. Dept of Respiratory Medicine, Ghent University Hospital, Ghent, Belgium
19. Faculty of Medicine, University of Coimbra; Ageing@Coimbra Reference Site, Portugal
20. Food Allergy Referral Centre Veneto Region, Department of Women and Child Health, Padua General University Hospital, Padua, Italy
21. Caisse Assurance Retraite et Santé Au Travail Languedoc-Roussillon (CARSAT-LR), 34000 Montpellier, France
22. EFA European Federation of Allergy and Airways Diseases Patients' Associations, Brussels, Belgium
23. University of Southern Denmark, Kolding, Denmark
24. Centre of Pneumology, Coimbra University Hospital, Portugal
25. Department of Prevention of Environmental Hazards and Allergology, Medical University of Warsaw, Poland
26. Helsinki University, Helsinki University Hospital; University of Oulu, Center for Life Course Health Research, Finland
27. European Union Geriatric Medicine Society, EUGMS
28. Vilnius University Public Health Institute, Center of Quality of Life Research, Vilnius University Clinic of Children's Diseases, Vilnius, Lithuania
29. European Association of Pediatrics (EAP/UEMS-SP)
30. Celal Bayar University Department of Pulmonology, Manisa, Turkey
31. Turkish Thoracic Society
32. Allergy-Centre-Charité at the Department of Dermatology, Charité - Universitätsmedizin Berlin, Berlin, Germany; Secretary General of the Global Allergy and Asthma European Network (GA2LEN)
33. Department of Dermatology, Medical University of Graz, Graz, Austria.
34. Department of Clinical Research Center, International University of Health and Welfare/Sanno Hospital, Tokyo, Japan
35. Thorax Institute, Hospital Clinic, IDIBAPS, University of Barcelona and CIBER Enfermedades Respiratorias, Spain
36. Swiss Institute of Allergy and Asthma Research (SIAF), University of Zurich, Davos, Switzerland
37. EPAR U707 INSERM, Paris and EPAR UMR-S UPMC, Paris VI, Paris, France
38. Department of Allergy and Immunology, Hospital Quirón Bizkaia, Erandio, Spain.
39. Centre for Research in Environmental Epidemiology (CREAL), Barcelona, Spain
40. Hospital del Mar Research Institute (IMIM), Barcelona, Spain
41. CIBER Epidemiología y Salud Pública (CIBERESP), Barcelona, Spain
42. Department of Experimental and Health Sciences, University of Pompeu Fabra (UPF), Barcelona, Spain

43. Digi Health, Montpellier, France
44. David Hide Asthma and Allergy Research Centre, Isle of Wight, United Kingdom
45. Shanghai Respiratory Research Institute, Vice President of Respiratory Society, Chinese Medical Association, China and Chinese Alliance against Lung Cancer
46. Allergy and Respiratory Diseases Clinic, DIMI, University of Genoa, IRCCS AOU San Martino-IST, Genoa, Italy.
47. Upper Airways Research Laboratory, ENT Dept, Ghent University Hospital, Ghent, Belgium
48. EuroAsian Respiratory Society, Astana City, Kazakhstan
49. PNDAR, Portuguese National Programme for Respiratory Diseases, Faculdade de Medicina de Lisboa, Lisbon, Portugal
50. Department of Medicine, University of Cape Town, Cape Town, South Africa
51. Section of Respiratory Disease, Department of Oncology, Haematology and Respiratory Diseases, University of Modena and Reggio Emilia, Modena, Italy
52. Service de pneumologie IV, hôpital Abderrahman Mami, Ariana 2080, Tunisie.
53. Dept. of Respiratory Medicine, National Institute of Diseases of the Chest and Hospital, Dhaka, Bangladesh.
54. Centre for Individualized Medicine, Department of Pediatrics, Faculty of Medicine, Linköping University, Sweden
55. Department of Dermatology and Allergy, Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany.
56. Department of Dermatology and Allergy Centre, Odense University Hospital, Odense, Denmark
57. Department of Respiratory Medicine and Allergology, University Hospital, Lund, Sweden.
58. Department of Geriatrics, Montpellier University hospital, Montpellier, France
59. EA 2991, Euromov, University Montpellier, France
60. Department of Pathophysiology and Transplantation, University of Milan, IRCCS Fondazione Ca'Granda Ospedale Maggiore Policlinico, Via F. Sforza 35, Milan, Italy
61. Pediatric Department, University of Verona Hospital, Verona, Italy
62. Department of Public Health and Infectious Diseases, Sapienza University of Rome, Italy
63. Second University of Naples and Institute of Translational Medicine, Italian National Research Council
64. Woolcock Institute of Medical Research, University of Sydney and Sydney Local Health District, Glebe, NSW, Australia
65. Quebec Heart and Lung Institute, Laval University, Québec City, Quebec, Canada
66. Directeur Général Adjoint, Montpellier University Hospital, France
67. Health Economics and Health Technology Assessment, Institute of Health & Wellbeing, University of Glasgow, Glasgow, UK.
68. Institute of Lung Health, Respiratory Biomedical Unit, University Hospitals of Leicester NHS Trust, Leicestershire, UK; Department of Infection, Immunity and Inflammation, University of Leicester, Leicester, UK
69. Department of Clinical Epidemiology and Biostatistics, McMaster University, HSC Room 2C16, 1280 Main Street West Hamilton, Hamilton, Canada
70. Universitätsmedizin der Johannes Gutenberg-Universität Mainz, Mainz, Germany
71. National Heart and Lung Institute, Imperial College, London, UK Wellcome Centre for Global Health, Imperial College, London, UK MRC-PHE Centre for Environment and Health, Imperial College, London, UK
72. Imperial College and Royal Brompton Hospital, London, UK
73. Centro Medico Docente La Trinidad, Caracas, Venezuela
74. Department of Respiratory Diseases, Montpellier University Hospital, France
75. Imperial College London - National Heart and Lung Institute, Royal Brompton Hospital NHS, London, UK.
76. Institute of Ageing and Chronic Disease, University of Liverpool and University Hospital Aintree, Liverpool UK
77. Federal University of Minas Gerais, Medical School, Department of Pediatrics, Belo Horizonte, Brazil.
78. Assitant Director General, Montpellier, Région Languedoc Roussillon, France
79. Department of Paediatrics, Oslo University Hospital and University of Oslo, Oslo, Norway
80. Allergy and Asthma Associates of Southern California, Mission Viejo, CA
81. Regional Ministry of Equality, Health and Social Policies of Andalusia
82. Division of Allergy/Immunology, University of South Florida, Tampa, Fla.
83. Allergy and Immunology Laboratory, Metropolitan University, Simon Bolivar University, Barranquilla, Colombia. and SLaii, Sociedad Latinoamericana de Alergia, Asma e Immunologia
84. Department of Social Medicine, Faculty of Medicine, University of Crete, PO Box 2208, Heraklion, 71003, Crete, Greece
85. national Cooperative Group of Paediatric Research on Asthma, Asthma Clinic and Education Center of the Capital Institute of Pediatrics, Peking and Center for Asthma Research and Education, Beijing, China
86. Chachava Clinic, David Tvildiani Medical University-AIETI Medical School, Grigol Robakidze University, Tbilisi, Georgia
87. Pulmonology Research Institute FMBA, Moscow, Russia and GARD Executive Committee
88. Imperial College, National Heart & Lung Institute, London, UK
89. Medicine Department, IRCCS-Azienda Ospedaliera Universitaria San Martino, Genoa, Italy
90. Latvian Allergy Association, Riga, Latvia
91. Department of Medicine, Nova Southeastern University, Davie, Florida, USA.
92. Department of Paediatrics, Imperial College London, uk
93. The Centre for Allergy Research, The Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden
94. Department of Dermatology and Allergy, Technische Universität München, Munich, Germany; ZAUM-Center for Allergy and Environment, Helmholtz Center Munich, Technische Universität München, Munich, Germany

95. Allergy Division, Chest Disease Department, University Hospital of Strasbourg, Strasbourg, France
96. EUREGHA, European Regional and Local Health Association, Brussels, Belgium and University of Edinburgh, UK
97. Allergology and Immunology Discipline, "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania.
98. Kronikgune, Bilbao, Basque Region, Spain
99. Department of Medicine, Division of Clinical Immunology and Allergy, McMaster University, Hamilton, Ontario, Canada
100. Laboratoire de Pharmacologie Respiratoire UPRES EA220, Hôpital Foch, Suresnes Université Versailles Saint-Quentin
101. Rangueil-Larrey Hospital, Respiratory Diseases Department , Toulouse , France
102. Service de physiologie respiratoire, Hôpital Cochin, Université Paris-Descartes, Assistance publique-Hôpitaux de Paris, France
103. University Southampton Faculty of Medicine and NIHR Southampton Respiratory Biomedical Research Unit, UK.
104. University Clinic of Pulmology and Allergy, Medical Faculty Skopje, R. Macedonia.
105. Service de Pneumo-Allergologie, Centre Hospitalo-Universitaire de Béni-Messous, Algiers, Algeria
106. Ecole des Mines, Alès, France
107. Medical Faculty, Vilnius University, Vilnius, Lithuania.
108. Allergy and Clinical Immunology Section, National Heart and Lung Institute, Imperial College London, United Kingdom
109. Section of Allergy and Immunology, Saint Louis University School of Medicine, Saint Louis, Missouri, USA.
110. Pediatric Allergy and Immunology Unit, Ain Shams University, Cairo, Egypt.
111. Clinic of Children's Diseases, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
112. Modena University, Italy
113. Education for Health, Warwick, UK
114. Division of Allergy, Department of Pediatric Medicine - The Bambino Gesù Children's Research Hospital Holy see, Rome, Italy
115. Global Allergy and Asthma Platform GAAPP, Altgasse 8-10, 1130 Vienna, Austria
116. Center for Health Technology and Services Research- CINTESIS, Faculdade de Medicina, Universidade do Porto; and Allergy Unit, CUF Porto Instituto & Hospital, Porto, Portugal.
117. Department of Otorhinolaryngology, Academic Medical Centre, Amsterdam, Netherlands
118. Department of Epidemiology, Regional Health Service Lazio Region, Rome, Italy
119. Repatriation General Hospital, Adelaide, South Australia, Australia
120. Athens Chest Hospital, Athens, Greece
121. National Center for Disease Control and Public Health of Georgia, Tbilisi, Georgia.
122. Polibienestar Research Institute, University of Valencia, Valencia, Spain
123. Department of Pulmonary Diseases, Istanbul University, Cerrahpasa Faculty of Medicine, Turkey
124. Allergy and Immunology Division, Clinica Ricardo Palma, Lima, Peru
125. Universidad Autónoma de Nuevo León, Mexico
126. Center of Allergy and Immunology, Georgian Association of Allergology and Clinical Immunology, Tbilisi, Georgia
127. Latvian Association of Allergists, Center of Tuberculosis and Lung Diseases, Riga, Latvia
128. University of Washington School of Medicine, Faculty of the Department of Neurology, USA
129. University Hospital Olomouc – National eHealth Centre
130. Immunology and Allergy Division, Clinical Hospital, University of Chile, Santiago, Chile
131. Centre for Infection and Immunity, School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast, UK
132. Department of Respiratory Diseases, Odense University Hospital, Denmark.
133. NHS Scotland
134. Institute of Epidemiology I, German Research Centre for Environmental Health, Helmholtz Zentrum München, Neuherberg, Germany
135. Agence Régionale de Santé, 34067 Montpellier Cedex 2, France
136. Vienna Challenge Chamber, Vienna, Austria
137. Department of Paediatrics and Child Health, University College Cork, Cork, Ireland
138. University of Southampton Faculty of Medicine, University Hospital Southampton, Southampton, United Kingdom.
139. Université Paris-Sud; Service de Pneumologie, Hôpital Bicêtre; Inserm UMR\_S999, Le Kremlin Bicêtre, France
140. School of Psychology, Plymouth University, Plymouth, UK
141. FEDERICO II UNIVERSITY HOSPITAL/CAMPANIA RS
142. Servicio de Alergia e Inmunología, Clínica Santa Isabel, Buenos Aires, Argentina
143. Universidade Federal de Sao Paulo, Brazil
144. President, Libra Foundation, Buenos Aires, Argentina
145. The George Institute for Global Health and The University of Sydney, Australia.
146. Airway Disease Infection Section, National Heart and Lung Institute, Imperial College; MRC & Asthma UK Centre in Allergic Mechanisms of Asthma, London, UK
147. Medical Commission, Montpellier University Hospital, Montpellier, France
148. Children's Clinic of Tartu University Hospital, Estonia
149. Hallym University College of Medicine, Hallym University Sacred Heart Hospital, Gyeonggi-do, South Korea.

150. Allergy department, Centre de l'Asthme et des Allergies. Hôpital d'Enfants Armand-Trousseau (APHP); Sorbonne Universités, UPMC Univ Paris 06, UMR\_S 1136, Institut Pierre Louis d'Epidémiologie et de Santé Publique, Equipe EPAR, F-75013, Paris, France
151. Ukrainian Medical Stomatological Academy, Poltava, Ukraine
152. National Research Center, Institute of Immunology, Federal Medicobiological Agency, Laboratory of Molecular immunology, Moscow, Russian Federation
153. Pediatric Allergy and Asthma Unit, Hacettepe University School of Medicine, Ankara, Turkey
154. Hacettepe University, School of Medicine, Department of Chest Diseases, Immunology and Allergy Division, Ankara, Turkey
155. Institute of Social Medicine, Epidemiology and Health Economics, Charité - Universitätsmedizin Berlin, Berlin, and Institute for Clinical Epidemiology and Biometry, University of Wuerzburg, Germany
156. Department of Medicine, McMaster University, Health Sciences Centre 3V47, 1280 Main Street West, Hamilton, Canada
157. Center for Rhinology and Allergy, Wiesbaden, Germany.
158. Société de Pneumologie de Langue Française, Espace francophone de Pneumologie, Paris, France
159. Department of Respiratory Medicine, Faculty of Medicine and Dentistry, University Hospital Olomouc, Czech Republic
160. University of Groningen, University Medical Center Groningen, Beatrix Children's Hospital, Department of Pediatric Pulmonology and Pediatric Allergy, GRIACResearch Institute, Groningen, the Netherlands
161. Department of Immunology, Rheumatology and Allergy, Medical University of Lodz, and HARC, Poland
162. Sachs' Children's Hospital, Stockholm; Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden
163. Division of Internal Medicine, Asthma and Allergy, Barlicki University Hospital, Medical University of Lodz, Poland
164. Clinic of infectious, chest diseases, dermatology and allergology, Vilnius University, Vilnius, Lithuania
165. VIB Inflammation Research Center, Ghent University, Ghent, Belgium
166. Department for Pediatric Pneumology and Immunology, Charité Medical University, Berlin, Germany
167. Clínica de Alergia, Asma y Pediatría, Hospital Médica Sur, México
168. University of Medicine and Pharmacy, Hochiminh City, Vietnam
169. Departments of Internal Medicine and Pediatrics (Divisions of Allergy and Immunology), University of Tennessee College of Medicine, Germantown, TN, USA.
170. Scottish Centre for Respiratory Research, Cardiovascular & Diabetes Medicine, Medical Research Institute, Ninewells Hospital, University of Dundee, UK
171. State Key Laboratory of Respiratory Diseases, Guangzhou Institute of Respiratory Disease, the First Affiliated Hospital of Guangzhou Medical University, Guangzhou 510120, China.
172. Oslo University Hospital, Department of Paediatrics, Oslo, and University of Oslo, Faculty of Medicine, Institute of Clinical Medicine, Oslo, Norway
173. Department of Pulmonary Medicine, CHU Sart-Tilman, Liege, Belgium
174. Queen's Medical Research Institute, University of Edinburgh, Edinburgh, UK
175. Service de Pneumo-allergologie, Hôpital Saint-Joseph, Paris, France
176. University of Nantes, Service de Pneumologie, UMR INSERM, UMR1087and CNR 6291, l'institut du thorax, Nantes, France
177. Department of Pulmonary Medicine, Rashid Hospital, Dubai, UAE.
178. Directorate of Finance, eHealth & Pharmaceuticals, Scottish Government Health Department, Edinburgh, UK
179. Department of Respiratory Medicine, University of Bratislava, Bratislava, Slovakia
180. Department of Medicine (RCSI), Bon Secours Hospital, Glasnevin, Dublin, Ireland
181. Cardiovascular and Thoracic Department, AOU Città della Salute e della Scienza di Torino, Italy
182. Division of Clinical Immunology and Allergy, Laboratory of Behavioral Immunology Research, The University of Mississippi Medical Center, Jackson, Mississippi, USA
183. Respiratory Medicine Research, Shahid Beheshti University of Medical Sciences, Tehran, Iran
184. VingCard Elsafe
185. Allergie-Centrum-Charité at the Department of Dermatology and Allergy, Charité - Universitätsmedizin Berlin, Germany.
186. Maputo Central Hospital--Department of Paediatrics, Mozambique.
187. Institute of Environmental Medicine, Karolinska Institutet, Stockholm
188. PNRD/Portuguese National Programme for Respiratory Diseases, Directorate-General of Health, Lisbon, Portugal
189. Allergy and Asthma Medical Group and Research Center, San Diego, California, USA.
190. Royal Brompton Hospital, London, UK
191. Hautklinik - Klinik für Dermatologie & Allergologie, Universitätsklinikum der RWTH Aachen
192. Croatian Pulmonary Society
193. National Institute of Pneumology M. Nasta, Bucharest, Romania
194. Faculty of Medicine, University of Belgrade, Belgrade, Serbia. Serbian Association for Asthma and COPD
195. National Center for Research in Chronic Respiratory Diseases, Tishreen University School of Medicine, Latakia, SYRIA
196. Département de Pharmacologie, CHU de Bordeaux, Université Bordeaux, INSERM U657, Bordeaux Cedex, France
197. Department of Public health and biostatistics, Paris Descartes University, EA 4064
198. Paris municipal Department of social action, childhood, and health, Paris, France

199. Aura Andalusia, Spain
200. Allergy and Clinical Immunology Department, Hospital CUF-Descobertas, Lisboa, Portugal.
201. National Clinical Director for Respiratory Services, NHS England; Consultant Physician in Respiratory Medicine
202. Institute of Medical Statistics, Informatics and Epidemiology, Medical Faculty, University of Cologne, Germany
203. Unitat de Rinologia i Clínica de l'Olfacte, Servei d'ORL, Hospital Clínic, Clinical & Experimental Respiratory Immunoallergy, IDIBAPS, Barcelona, Spain.
204. Mustapha Hospital, Algiers, Algeria
205. Scientific Centre of Children's Health under the Russian Academy of Medical Sciences, Moscow, Russia
206. Section of Otolaryngology-Head and Neck Surgery, The University of Chicago Medical Center and The Pritzker School of Medicine, The University of Chicago, USA.
207. Hospital de Niños Orlando Alassia, Santa Fe, Argentina
208. Hospital of the Hospitaller Brothers in Buda, Budapest, Hungary
209. Pediatric Pneumology and Immunology, Charité Universitätsmedizin Berlin, Berlin, Germany.
210. EA4556 Epsilon, Université Montpellier 1, Montpellier, France
211. ENT Department, University Hospital of Kinshasa, Kinshasa, Congo
212. Department of Allergy, Immunology and Respiratory Medicine, Alfred Hospital and Central Clinical School, Monash University, Melbourne, Victoria, Australia; Department of Immunology, Monash University, Melbourne, Victoria, Australia
213. National Hospital Organization, Tokyo National Hospital, Tokyo, Japan.
214. Dept of Otorhinolaryngology, Chiba University Hospital, Chiba, Japan
215. Dept of Otolaryngology, Nippon Medical School, Tokyo, Japan
216. Centre Hospitalier Universitaire Pédiatrique Charles de Gaulle, Ouagadougou, Burkina Faso
217. Cardio-Thoracic and Vascular Department, University Hospital of Pisa, Italy
218. Dept. of Comparative Medicine; Messerli Research Institute of the University of Veterinary Medicine and Medical University, Vienna, Austria.
219. Department of Immunology and Allergology, Faculty of Medicine and Faculty Hospital in Pilsen, Charles University in Prague, Pilsen, Czech Republic
220. Center for Pediatrics and Child Health, Institute of Human Development, Royal Manchester Children's Hospital, University of Manchester, Manchester M13 9WL, UK. Allergy Department, 2nd Pediatric Clinic, Athens General Children's Hospital "P&A Kyriakou," University of Athens, Athens 11527, Greece.
221. Respiratory Medicine, Department of Medical Sciences, University of Ferrara, Ferrara, Italy.
222. Department of Allergy and Clinical Immunology, Ajou University School of Medicine, Suwon, South Korea
223. Nuffield Department of Medicine, University of Oxford, Oxford, UK.
224. Department of Pediatrics, Nippon Medical School, Tokyo, Japan
225. Permanent Secretary, Department of Health, Social Services & Public Safety, Northern Ireland
226. Center for Rhinology and Allergology, Wiesbaden, Germany and Department of Otorhinolaryngology, Head and Neck Surgery, Universitätsmedizin Mannheim, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany
227. Conseil Général de l'Economie. Ministère de l'Economie, de l'Industrie et du Numérique, Paris, France
228. Département de pédiatrie, CHU de Grenoble, BP 217, 38043 Grenoble cedex 9, France
229. Children's Hospital Srebrnjak, Zagreb, School of Medicine, University J.J. Strossmayer, Osijek, Croatia
230. Im GerontoLab Europe - Europäische Vereinigung für Vitalität und Aktives Altern (eVAA) e.V.
231. Karl Landsteiner Institute for Clinical and Experimental Pneumology, Hietzing Hospital, Wolkersbergenstraße 1, 1130 Vienna, Austria.
232. Clinic of Allergy & Asthma, Medical University Sofia, 1 Sv. Georgi Sofijski St., 1431 Sofia, Bulgaria
233. Allergy Diagnostic and Clinical Research Unit, University of Cape Town Lung Institute, Cape Town, South Africa
234. University of Groningen, University Medical Center Groningen, Department of Pulmonary Medicine and Tuberculosis, GRIAC Research institute, Groningen, the Netherlands
235. Academic Centre of Primary Care, University of Aberdeen, Aberdeen ; Research in Real-Life, Cambridge, UK.
236. LungenClinic Grosshansdorf, Airway Research Center North, Member of the German Center for Lung Research (DZL), Grosshansdorf, Germany. Department of Medicine, Christian Albrechts University, Airway Research Center North, Member of the German Center for Lung Research (DZL), Kiel, Germany
237. Conseil Départemental de l'Ordre des Pharmaciens, Maison des Professions Libérales, 34000 Montpellier, France
238. SLAAI
239. University of Nebraska Medical Center, Division of Pulmonary, Critical Care, Sleep & Allergy, Nebraska Medical Center, Omaha, Nebraska.
240. Salford, Royal NHS Foundation Trust & NHS England North, UK
241. Thorax Institute, Hospital Clinic, IDIBAPS, University of Barcelona, Spain
242. HOSPITAL UNIVERSITARIO DE GETAFE-SERVICIO MADRILEÑO DE SALUD
243. Association Asthme et Allergie, Paris, France
244. Primary Care Respiratory Research Unit. Institutode Investigación Sanitaria de Palma IdisPa, Palma de Mallorca, Spain
245. Allergy Unit, Complesso integrato Columbus, Rome, Italy.
246. Serviço de Imunoalergologia. Hospital da Luz. Lisboa. Portugal.
247. Hospital de Clinicas, University of Parana, Brazil

248. Department of Allergy, Asthma, and Immunology, Children's Mercy Hospitals and Clinics and Pediatrics and Medicine University of Missouri-Kansas City School of Medicine, Kansas City, USA
249. Division of Allergy Asthma and Clinical Immunology, Emek Medical Center, Afula, Israel
250. General Practitioner, Woodbrook Medical Centre, Loughborough, UK; Honorary Clinical Research Fellow, Allergy and Respiratory Research Group, The University of Edinburgh, Edinburgh, UK.
251. Allergy and Clinical Immunology Department, Centro Médico-Docente la, Trinidad and Clínica El Avila, 6a transversal Urb. Altamira, piso 8, consultorio 803, Caracas, 1060 Venezuela
252. The Royal National TNE Hospital, University College London, UK
253. Otolaryngology and Head & Neck Surgery, CHU Rangueil-Larrey, Toulouse, France,
254. Allergy Unit, Department of Dermatology, University Hospital of Zurich, Zürich, Switzerland
255. Helmholtz Zentrum München/Institute of Epidemiology I, Neuherberg, Germany
256. Allergy and Respiratory Research Group, Centre for Population Health Sciences, The University of Edinburgh, Medical School, UK
257. Child Health, Queen's University Belfast & Royal Belfast Hospital for Sick Children, UK
258. Department of Thoracic Medicine, University Hospital of Heraklion, Crete, Greece
259. University Hospital of Mont-Godinne, Catholic University of Louvain, Yvoir, Belgium
260. Sorbonne Universités, UPMC Univ Paris 06, UMR\_S 1158 Neurophysiologie Respiratoire Expérimentale et Clinique, Paris, France INSERM, UMR\_S 1158 Neurophysiologie Respiratoire Expérimentale et Clinique, Paris, France Dept. R3S,AP-HP, Groupe
261. Department of Pediatrics & Child Health, Department of Immunology, Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada
262. Sociedad Paraguaya de Alergia Asma e Inmunología, Paraguay
263. Julius Center of Health Sciences and Primary Care, University Medical Center Utrecht, University of Utrecht, Utrecht, the Netherlands
264. Division of Allergy, Clinical Immunology and Rheumatology, Department of Pediatrics, Federal University of São Paulo, São Paulo, Brazil.
265. Kyrgyzstan National Centre of Cardiology and Internal medicine, Euro-Asian respiratory Society, Bishkek, Kyrgyzstan
266. Pulmonary Division, Heart Institute (InCor), Hospital da Clinicas da Faculdade de Medicina da Universidade de Sao Paulo, Sao Paulo, Brazil
267. Academic Medical Centre, University of Amsterdam, The Netherlands.
268. Department of Epidemiology, CAPHRI School of Public Health and Primary Care, Maastricht University, Maastricht, The Netherlands.
269. Sidkkids hospitala and Institute of Health Policy, Management and Evaluation, Toronto, Canada
270. Centre of Pneumology, Faculty of Medicine, University of Coimbra, Coimbra, Portugal.
271. Division of Allergy and Clinical Immunology, University of Salerno, Salerno, Italy
272. Division of Immunopathology, Department of Pathophysiology and Allergy Research, Center for Pathophysiology, Infectiology and Immunology, Medical University of Vienna, Vienna, Austria
273. Pneumology and Allergy Department. Hospital Clínic, Clinical & Experimental Respiratory Immunoallergy, IDIBAPS, Barcelona, Spain.
274. Dept. of Lung Diseases and Clinical Allergology, University of Turku, Finland.
275. Unité de Pharmacoépidémiologie, CHU-Lyon - UR 5558 CNRS - Université Claude Bernard Lyon, France.
276. Clinical Immunology and Allergy Unit, Department of Medicine Solna, Karolinska Institutet and University Hospital, Stockholm
277. Dept of Chest Medicine, Centre Hospitalier Universitaire Dinant-Godinne, Université Catholique de Louvain, Yvoir, Belgium
278. FILHA, Finnish Lung Association
279. Gérotopôle, CHU Toulouse
280. Centre for Respiratory Medicine and Allergy, Institute of Inflammation and Repair, Manchester Academic Health Science Centre, The University of Manchester, Manchester, UK; University Hospital of South Manchester, Manchester NHS Foundation Trust, Manchester, UK
281. Pulmonary Unit, Department of Cardiology, Thoracic and Vascular Medicine, Arcispedale S.Maria Nuova/IRCCS, Research Hospital, Reggio Emilia, Italy, Regional Agency for Health and Social Care
282. Division of Allergy and Immunology, Department of Pediatrics, Siriraj Hospital, Mahidol University Faculty of Medicine, Bangkok 10700, Thailand.
283. Pulmonary Environmental Epidemiology Unit, CNR Institute of Clinical Physiology, Pisa (Italy), Via Trieste 41, 56126, Pisa, Italy ; and CNR Institute of Biomedicine and Molecular Immunology "A. Monroy", Via U. La Malfa 153, 90146, Palermo, Italy.
284. Department of Medicine, Pulmonary and Critical Care Medicine, University Medical Center Giessen and Marburg, Philipps-University Marburg, Germany
285. Sotiria Hospital, Athens, Greece
286. Dept of Otorhinolaryngology, HNO-Klinik, Universitätsklinikum Düsseldorf, Germany
287. Hôpital Albert Calmette, CHRU, Lille, France
288. Asthma UK, Mansell street, London, UK

289. Department of Otolaryngology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore 119228, Singapore.
290. Eshelman School of Pharmacy, University of North Carolina, Chapel Hill, NC, USA
291. Bradford Institute for Health Research, Bradford Royal Infirmary, Bradford, UK
292. Department of Research, Olmsted Medical Center, Rochester, Minnesota, USA
293. Cyprus International Institute for Environmental & Public Health in Association with Harvard School of Public Health, Cyprus University of Technology, Limassol, Cyprus; Department of Pediatrics, Hospital "Archbishop Makarios III", Nicosia, Cyprus.
294. The Allergy and Asthma Institute, Pakistan
295. Social Sciences, University of Southampton
296. Department of Paediatrics and Child Health, Red Cross Children's Hospital, and MRC Unit on Child & Adolescent Health, University of Cape Town, Cape Town, South Africa
297. Universidad Católica de Córdoba, Córdoba, Argentina.
298. Department of Otolaryngology, Head and Neck Surgery, Beijing Tongren Hospital, Capital Medical University, Beijing 100730, China
299. University Clinic of Respiratory and Allergic Diseases, Golnik, Slovenia.
300. Department of Physiology, CHRU and Vice President for Research, University Montpellier, France

### **Address for correspondence**

Professor Jean Bousquet  
CHRU, 371 Avenue du Doyen Gaston Giraud, 34295 Montpellier Cedex 5, France    Tel +33 611 42 88 47    [jean.bousquet@orange.fr](mailto:jean.bousquet@orange.fr)



## Summary

Action Plan B3 of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) focuses on the integrated care of chronic diseases. Area 5 (Care Pathways) was initiated using chronic respiratory diseases (CRD) as a model. The CRD action plan includes (i) AIRWAYS integrated care pathways (ICPs), (ii) the joint initiative between the Reference site MACVIA-LR (Reference Site, Contre les Maladies Chroniques pour un Vieillissement Actif) and ARIA (Allergic Rhinitis and its Impact on Asthma), (iii) Commitments for Action to the EIP on AHA and the AIRWAYS ICPs network. It is deployed in collaboration with the WHO Global Alliance against Chronic Respiratory Diseases (GARD). The EIP on AHA has proposed a 5-step framework for developing an individual scaling up strategy: (i) what to scale up: (i-a) databases of good practices, (i-b) assessment of viability of the scaling up of good practices, (i-c) classification of good practices for local replication and (ii) how to scale up: (ii-a) facilitating partnerships for scaling up, (ii-b) implementation of key success factors and lessons learnt, including emerging technologies for individualised and predictive medicine. This strategy has already been applied to the CRD action plan of the EIP on AHA.

## Key words

EIP on AHA, European Innovation Partnership on Active and Healthy Ageing, chronic respiratory diseases, AIRWAYS ICPs, MACVIA, ARIA, scaling up

## Abbreviations

AIRWAYS ICPs: Integrated care pathways for airway diseases  
ARIA: Allergic Rhinitis and Its Impact on Asthma  
CA: Commitment for Action  
CDSS: Clinical Decision Support System  
CDSS: Clinical decision support system  
COPD: Chronic obstructive pulmonary disease  
CRD: Chronic Respiratory Diseases  
DG: Directorate General  
EIP on AHA: European Innovation Partnership on Active and Healthy Ageing  
EU: European Union  
GA<sup>2</sup>LEN: Global Allergy and Asthma European Network (FP6)  
GARD: WHO Global Alliance against Chronic Respiratory Diseases  
ICP: Integrated care pathway  
IPCRG: International Primary Care Respiratory Group  
MACVIA-LR: contre les Maladies Chroniques pour un Vieillissement Actif (Fighting chronic diseases for active and healthy ageing)  
MASK: MACVIA-ARIA Sentinel Network  
MOH: Ministry of Health  
NCD: Non-communicable disease  
NHS: National Health Service  
SCUAD: Severe chronic upper airway disease  
WHO: World Health Organization  
VAS: Visual analogue scale

## Introduction

Health and care services in Europe are undergoing changes to adapt systems to the growing demands caused by expansion of chronic diseases and ageing. This restructuring involves development and testing of innovative solutions as well as the implementation of the most successful pilots. The multitude of good practices developed throughout the EU favours a comprehensive and multi-dimensional scaling-up strategy at European level (1).

The European Commission launched the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA, DG Santé and DG Connect) to enhance EU competitiveness and tackle societal challenges through research and innovation (Table 1) (2).

**Table 1: Priority Areas and Action Plans of the EIP on AHA**

Priority Areas	Action Plans	
Prevention of diseases and health promotion	<b>A1</b>	Innovative ways to ensure that patients adhere to their treatment
	<b>A2</b>	Innovative solutions for personalised health management, with focus on falls prevention
	<b>A3</b>	Action for preventing functional decline and frailty, with a particular focus on malnutrition
Care and cure	<b>B3</b>	Scaling up and replication of successful innovative integrated care models for CD amongst older patients, such as through remote monitoring
Active and independent living of older adults	<b>C2</b>	Improving the uptake of interoperable independent living solutions including guidelines for business models
Horizontal topics	<b>D4</b>	Networking and knowledge sharing on innovation for age-friendly environments

Chronic respiratory diseases (CRDs) are the pilot for chronic diseases of the EIP on AHA Action Plan B3 (3, 4). Several effective plans exist in Europe for CRDs, but they are rarely deployed to other regions or countries. There is an urgent need for scaling up strategies in order to (i) avoid fragmentation, (ii) improve health care delivery across Europe, (iii) speed up the implementation of good practices using existing cost-effective success stories and (iv) meet the triple win of the EIP on AHA.

- Enabling EU citizens to lead healthy, active and independent lives while ageing.
- Improving the sustainability and efficiency of social and health care systems.
- Boosting and improving the competitiveness of the markets for innovative products and services, responding to the ageing challenge and creating new opportunities for businesses.

This paper presents the scaling up strategy for CRDs strictly following the five-step framework scaling up strategy of the EIP on AHA. It may be used as a model for scaling up activities in other areas of the EIP on AHA and other chronic diseases.

## 1- AIRWAYS ICPs, the pilot for chronic diseases of the EIP on AHA

CRDs include a variety of diseases such as airway diseases (allergic and non-allergic asthma, rhinitis, rhinosinusitis and COPD), occupational lung diseases, sleep apnoea syndrome, interstitial diseases, pulmonary vascular diseases and genetic diseases such as cystic fibrosis (5, 6). Over 1 billion people in the world suffer from CRDs. They represent one of the priorities of the EU (3053<sup>rd</sup> and 3131<sup>st</sup> Conclusions of the EU Council, 2010 and 2011) (7, 8), WHO (WHO 2013-2012 Noncommunicable Disease Action Plan) and the United Nations (High Level meeting on Non-Communicable Diseases, 2011) (9). The 2011 Polish Presidency of the EU Council made the prevention, early diagnosis and treatment of asthma and allergic diseases a priority for the EU's public health policy in order to reduce health inequalities (7). The early determinants of CRDs were reinforced during the Cyprus Presidency of the EU Council (10). The 2014 Italian Presidency of the EU Council has prioritized CRDs. CRDs represent a model of chronic diseases due to their prevalence, burden (e.g. 3 million annual deaths due to COPD), and comorbidities with other chronic diseases (11).

The initiative AIRWAYS ICPs (Integrated care pathways for airway diseases) (3) has been approved

by the EIP on AHA as the model of chronic diseases of the B3 Action Plan. It is a GARD (Global Alliance against Chronic Respiratory Diseases, WHO) Research Demonstration Project (5). It was launched by NHS England (Newcastle, February 2014) (12) and has been endorsed by the EIP on AHA Reference Site Network.

The objectives of AIRWAYS ICPs are to launch a collaboration to develop practical multisectoral care pathways (ICPs) to reduce CRD burden, mortality and multimorbidity. AIRWAYS-ICPs propose a feasible, achievable and manageable project from science to guidelines and policies using existing networks and stakeholders committed to the Action Plan B3 of the EIP on AHA and GARD (5). It is implemented and scaled up in Europe by the EIP on AHA and globally with GARD.

AIRWAYS-ICPs has strategic relevance to the European Union Health Strategy and the WHO NCD Action Plan (2013–2020). It adds value to existing public health knowledge (Table 2).

**Table 2: List of activities implemented by AIRWAYS ICPs**

	<b>AIRWAYS ICPs proposal</b>	<b>Implementation</b>
1	Proposing a common framework of care pathways for CRDs to facilitate comparability and transnational initiatives, and plans targeted to all populations according to culture, health systems and income	A repository is under development (PROEIPAHA) and the GARD strategy for adaptation to cultural beliefs and barriers is used (6).
2	Developing a strategy for low and middle-income settings.	AIRWAYS ICPs uses existing WHO programmes such as the WHO GARD, WHO PEN, the essential list of drugs (5, 13, 14) and management plans already successfully tested in low and middle-income countries (13, 15, 16).
3	Aiding risk stratification in chronic disease patients with a common strategy.	A common risk stratification strategy for all chronic diseases is available (17-19).
4	Defining important questions on CRDs in the old age.	Questions on asthma-COPD and rhinitis have been examined using a Delphi process (in preparation).
5	Developing integrated care pathways for CRDs and their comorbidities, with a specific focus on the elderly	<ul style="list-style-type: none"> <li>• Developing ICPs for CRDs and their comorbidities, with a specific focus on the elderly (20-25)</li> <li>• Building a sentinel network for asthma and other allergic diseases (26).</li> </ul>
6	Tackling chronic diseases across the life cycle	CRDs occur along the life cycle and they should be prevented, diagnosed and managed early to promote AHA (7, 8, 10, 27)
7	Interacting with frailty in CRD (EIP on AHA Action Plan A3) and defining active and healthy ageing.	Frailty is associated with chronic diseases and CRD. It is important to consider frailty in the management of CRD and to use an operational definition of AHA (28-31, 32, 33).
8	Implementing emerging technologies for individualised and predictive medicine in accordance with guidelines proposed by the European Commission ( <a href="https://www.casym.eu">https://www.casym.eu</a> ).	MASK (MACVIA-ARIA sentinel network) uses emerging technologies to develop a management strategy of rhinitis and asthma multimorbidity. It is available in 15 EU countries (26, 34).
9	Having a significant impact on the health of citizens in the short term (reduction of morbidity, improvement of education in children and of work in adults) the long-term (AHA), and the development of health promotion.	Asthma and COPD national plans are cost-efficient. Some have been scaled up successfully (35). New hypotheses concerning the development of allergy have been recently proposed. They may lead to novel prevention strategies (36, 37).
10	Educational activities	Educational activities are part of any scaling up strategy
11	Stratification of health systems in Europe and beyond (EIP on AHA Action Plan A3, AA4-B3)	DG Connect has initiated this project (Wouter, submitted).

## 2- Five-step framework scaling up strategy of the EIP on AHA

Scaling up is often considered as a continuous process of change and adaptation that can take different forms (38). The EIP on AHA has proposed a 5-step framework for developing an individual scaling up

strategy. Area 5 has already used all these steps (Table 3). The scaling up process of AIRWAYS ICPS has already been initiated, during an Action Plan B3 meeting in Brussels (March 2014).

**Table 3: The 5-step framework of EIP on AHA scaling up strategy**

Step	Scaling up strategy	Individual scaling up strategy
<i>What to scale up</i>		
1	Database of good practices	
2	Assessment of viability of the scaling up of good practices	
3	Classification of good practices for local replication	
<i>How to scale up</i>		
4	Facilitating partnerships for scaling up	
5	Implementation Key success factors and lessons learnt	Planning and initiating the service
		Setting up a system for change
		Organisational process and design choices
		Training and skills for the work force
		Appropriate resourcing for equipment
		Integration of clinical record systems
		Creating capacity
Monitoring, evaluation and dissemination		

In order to achieve a successful outcome for scaling up of innovative practice, the workforce should be appropriately educated in disease management, the necessary skills (e.g. spirometry, inhaler technique) should be present, and sufficient capacity made available both for training and the extra time necessary in consultation with the individual patient. These were critical factors in achieving success in the Finnish asthma and COPD ten year plans (39). Clinical recording systems need to be integrated to facilitate audit and appropriate sharing of clinical records.

### 3- Application of the EIP on AHA scaling up strategy to chronic respiratory diseases

#### 3-1-Good practices in CRDs

##### 3-1-1- AIRWAYS ICPS

Six commitments for action have already been submitted to the EIP on AHA to support AIRWAYS ICPS. Their good practices are complementary for the scaling up strategy (Table 4).

**Table 4: Good practices of the EIP on AHA Commitments for Action on CRDs**

	Activity		Expertise
<b>MACVIA-LR (Languedoc Roussillon)</b>	<ul style="list-style-type: none"> <li>AIRWAYS ICPS</li> <li>NCD global approach of multimorbidity</li> <li>Frailty and CRD, a social approach</li> <li>MASK</li> <li>Eurobiomed</li> </ul>	See Table 2	<ul style="list-style-type: none"> <li>Founder of AIRWAYS ICPS.</li> <li>Uniform definition of NCD severity and control with implementation in rural remote areas and rheumatology.</li> <li>Definition of AHA and implementation at the social level with the French national retirement fund (CARSAT)</li> <li>ICT solution for rhinitis and asthma</li> <li>EUROBIOMED is the catalyst of the health sector in the Provence-Alpes-Côte d'Azur and Languedoc-Roussillon regions. We provide resources and initiatives to help life science companies achieve their business goals and improve life through innovations in health.</li> </ul>
<b>Finland</b>	Finnish asthma, COPD and allergy plans	(39-41)	Finnish plans for asthma (40), allergy (41) and COPD (39), are the prototypes of national plans for CRDs globally (42)
<b>Norway</b>	Deployment of the Finnish allergy plan to Norwegian	(43)	Deployment of the Finnish allergy plan to all the regions of Norway. This expertise can be used to deploy national plans to regions.

	regions		A European generic platform to reduce the allergy burden was created based upon the Finnish Asthma and Allergy plan
<b>Poland</b>	Seniorial policy of Poland following the EIP on AHA recommendations including the 2011 EU Council recommendations	(7, 8) (33, 44)	The CA of Poland was the initiator of the EU Council policy on CRD in children (7) and further developed the seniorial policy of Poland which follows the EIP on AHA proposals. This seems to be the first AHA national project.
<b>Portugal</b>	National coordination and national plan for all CRDs	(45)	The national coordination is lead by the Directorate General of Health and includes all stakeholders required for a national plan which is deployed in the regions. The plan follows the Portuguese National Programme for Respiratory Diseases (PNDR).
<b>Turkey</b>	National coordination and Role of the CRD action plan on the ministerial NCD action plan	(46, 47)	The first national coordination of GARD including the MOH, WHO national office and major societies. Extremely successful programme with all public and private stakeholders of a country. Excellent example for scale up strategy

- AIRWAYS ICPs study groups exist in all but 2 EU countries (Luxembourg, Malta). They follow the GARD model deployed in Turkey (46, 47) and Italy (13, 48).
- Governments of countries (e.g. Lithuania, Poland, Portugal, Turkey) or regions (e.g. Emilia-Romagna) are involved in AIRWAYS ICPs. One of the commitments for action (Norway) is a joint action between the MOH of Finland and Norway (43).

### 3-1-2- Other international, national or regional projects

Many guidelines, ICPs and national plans exist for the most common CRDs (asthma, COPD, rhinitis).

- The Finnish plans for asthma (40), allergy (41) and COPD (39), considered to be the prototypes of national plans for CRDs (42). Polastma (Poland) is, in particular, derived from the asthma plan (35). A review on the European asthma plans based on the Finnish asthma plan is available (42).
- The Portuguese National Programme for Respiratory Diseases (PNDR), the first national programme including all respiratory diseases (45).
- In the Netherlands, the SMART-formulated collaborative National Action programme against Chronic Lung Diseases (NACL) aims to improve the cost-effectiveness of respiratory prescribing, while reducing hospitalisation days, productivity loss, adolescent smoking, and mortality due to asthma and COPD. Both the Ministry of Health and the collective Health Insurers Netherlands are funding the programme (13).
- Several national or regional plans on asthma, COPD, other chronic respiratory diseases and allergy.
- Guidelines or strategies for asthma (49-52), COPD (53), rhinitis (21) , rhinosinusitis (54) or severe asthma (55) (Table 5).

**Table 5: An example of scaling up strategy: ARIA (Allergic rhinitis and its impact on asthma) (21, 26)**

Allergic rhinitis is one of the most prevalent diseases in the world (25% of the EU population). Although symptoms of rhinitis appear to be trivial, the disease affects social activities, school and work performance e (56). It is often associated with or precedes asthma (including in the old age people) (57, 58).. Allergic rhinitis has been considered to alter AHA if not appropriately managed (7, 8).

- ARIA, a guideline for allergic rhinitis and its multimorbidity with asthma is the first multimorbidity guideline in chronic diseases. It was developed in the early 2000s in collaboration with WHO using the recommended methodology for guidelines (Shekelle) (59) and was updated in 2008 (60).
- It has been revised using the GRADE methodology (2010) (22, 61, 62).
- It is the most widely used guideline for rhinitis, and rhinitis and asthma multimorbidity globally (21).
- The ARIA classification of allergic rhinitis severity has been used for the development of Health Technology Assessment guidelines, in particular in the US (63).
- ARIA recommendations have been adopted by government guidelines (Brazil, Portugal, Singapore).
- ARIA is implemented in 64 countries and the pocket guide of the guideline has been translated into 52 languages.

- MASK-rhinitis (MACVIA-ARIA Sentinel Network for allergic rhinitis) is a care pathway centred around the using Information and Communications Technology (ICT) tools and a clinical decision support system (CDSS) based on ARIA (26, 34). This tool can be used by older age adults.
- Over 600 scientific papers have used ARIA for the classification of allergic rhinitis in clinical practice, clinical trials, as well as epidemiologic (from pre-school children to the old age people (58)), basic and translational research (21).

- Care pathways provided by national institutions (e.g. NICE in the UK or the Haute Autorité de Santé in France, ICP for acute asthma in children in Northern Ireland).
- The WHO guidelines for asthma and COPD in low-income settings (WHO PEN) (14).
- Management plans already successfully tested in low and middle-income countries (15).
- A common approach to severe asthma and allergic diseases (17, 19).
- In Spain, Polibienestar Research Institute is developing a Multi-Agent Simulator for people requiring prolonged mechanical ventilation based on the validated LTCMAS (64) and following the Canadian model (65), which is easily replicable and transferrable to other healthcare systems and to other diseases. Moreover, this tool offers great possibilities for scaling-up and for supporting the decision-making process of health professionals and policy-makers.
- Multimorbidity guidelines for CRDs do not exist, except for rhinitis and asthma (21).
- The risk for developing a COPD has only been studied in Italy and represents a chart risk applicable to the entire Europe.
- Palliative approaches to care in CRD, and planning end-of-life decisions and care / advanced care.
- Guidelines with a specific target on old age adults do not exist. A Delphi process is ongoing.

### **3-1-3- Guidance documents for primary care**

Some guidance documents are specifically directed to primary care - where most patients with CRDs are managed - such as COPD- Australia (Lung Foundation Australia with Thoracic Society of Australia and New Zealand) and Asthma Management in Australia (National Asthma Council Australia). IPCRG (International Primary Care Respiratory Group) has undertaken a mapping on national guidelines used by primary care for COPD, asthma, rhinitis, CAP, obstructive sleep apnea and stop smoking (<https://www.theipcr.org/display/ResMapping>).

### **3-2- Database**

A centralized repository of evidence is developed to preserve data throughout the lifecycle of the project. The repository is under development by the Commission.

### **3-3- Assessment of viability of the scaling up of good practices**

The members of AIRWAYS ICPs, ARIA and WHO GARD (6, 13, 48) are experienced to work together and already scaled up several CRD good practices. Scaling up for ARIA and WHO GARD follows the 7 key characteristics of the CORRECT features: Credible, Observable, Relevant, Relative advantage, Easy and Compatible (66, 67). The success of the scaling up strategy and its long-term viability (over 15 years for ARIA and 8 years in GARD) has been demonstrated. The GARD has been scaled up in several countries at governmental levels (13, 46-48).

Members of 13 EIP on AHA Reference Sites have agreed on the AIRWAYS ICPs concept and are co-authors of the paper (3). A meeting of all EIP on AHA Reference Sites was co-organised by the Région LR, North England and the EIP on AHA Reference Site Collaborative Network to scale up AIRWAYS ICPs in all Reference Sites (October 21, 2014).

The viability of ARIA and WHO GARD has been demonstrated. The viability of AIRWAYS ICPs will be analysed according to the set of parameters provided by the Commission in the near future. The analysis will be carried out within 6 months by an AIRWAYS ICPs expert panel and revised by an independent expert panel (6 additional months). The meeting for the analysis of the viability took

place in Lisbon (Directorate General of Health of Portugal), July 1-2, 2015 in collaboration with WHO GARD (68).

### 3-4- Classification of good practices for replication

Feasibility has been reviewed for the Finnish Asthma Plan (Table 6). It is expected that AIRWAYS ICPs following the expertise raised in ARIA and GARD will have a similar feasibility.

**Table 6: Classification of good practices for replication: The example of the Finnish Asthma Plan (40)**

Items		Example of the Finnish Asthma Plan
<b>Knowledge – gaps</b>	between knowledge and practice (research, specific)	The plan has been (69) tested and validated at the national level (40).
	existence of tested solutions (good examples, specific)	It has shown cost-effective reduction of hospitalisations, deaths and disability.
	large variations between countries (good examples, general)	The Finnish Asthma Plan has been deployed successfully to over 25 countries globally including developing countries. The same effectiveness has been demonstrated (70, 71). The Finnish Asthma Plan is considered to be the model of all asthma plans in the world (35).
<b>Reaction time</b>	calendar (time needed for implementation)	The Finnish Asthma Plan was a 10-yr plan. Most indicators were found to change significantly after 24-36 months, but the effectiveness improved over the 10-yr programme. In Brazil, an impact at population morbidity indicators was found after 24 months.
	effects/visibility (time needed to assess impact)	
<b>Stewardship</b>	administrative and political capacity. Leadership, inside the health sector and in other sectors (Health in All Policies)	Many plans are national plans supported by the MOH or the department of health of the region (e.g. Minas Gerais, Brazil). All stakeholders including health (specialists, GPs, nurses, pharmacists, other health care professionals), and social carers, and patients are involved in the plan. A specific action is devoted to education, coaching and training.
<b>Political agenda</b>	electoral programme	A specific attention has been put on social concerns and a promotion in the country at all levels (citizens and patients, health and social carers, politicians) has been continuously monitored.
	social concerns	
	Crisis	
	international institutions recommendations/ conditions	The Finnish Asthma Plan and its follow up (the Finnish Allergy Programme) (41, 72) has been endorsed by the Finnish MOH. Some plans in developed and developing countries (globally) are also under the MOH leadership and some have been endorsed by WHO GARD (GARD demonstration project). The Finnish Asthma Plan is listed in asthma guidelines.
<b>Costs and affordability</b>	it is important to consider the cost of the programme for selecting priority areas for investment. Certain decisions could need relevant investments (e.g. equipment, personnel, etc.) while others involve low direct economic cost (e.g. anti-tobacco strategies and legislation). The costs of a programme have to be considered in the context of the economic situation of the country (GDP/inhabitant; expansion/ recession/ stagnation; private and public debt; etc.).	The Finnish Asthma Plan is comprehensive including treatments, preventive measures (e.g. tobacco smoking), action plans, education at all levels. It was found to be cost-effective. This has been demonstrated in Finland, but also in other countries such as Brazil (42, 73, 74). Thus, reducing asthma burden is cost-effective in countries with different GDP/inhabitant, health and economic systems.
<b>Acceptability</b>	the support or the opposition that a certain policy is going to attract	The Plan was extremely well accepted in all countries where it was promoted (42).
<b>Monitoring</b>	the availability of the necessary information to monitor the starting	Baseline information on the burden of asthma is available even though in most developing countries there is no information (75).

<b>capability</b>	point, the processes and the outcomes.	Information on the success of the programme was easily documented (35, 70, 71) and carefully monitored.
	It highlights also the importance of transparency	National (or regional) statistics are transparent.
<b>Contextual factors</b>	Demographics	The Finnish Asthma Plan was a national plan covering the entire country. Some plans are regional plans (Bahia or Minais Gerais).
	Social and economic conditions	The Finnish Asthma Plan targeted the entire country. The Minais Gerais plan targets children in deprived areas (“favelas”) who are at high risk of severe exacerbations and death (76) so does the severe asthma programme established in Bahia, dealing with children and adults (70).
	Cultural factors other non-health care determinants of health that impact on population health and wellbeing	In Finland, barriers are not very important. However, in many developing countries, cultural barriers have been carefully considered according to a WHO report (6). They include culture, gender issues, socio-economic inequalities, health care access, access to essential medications and techniques.

### 3-5- Facilitating partnership for scaling up

#### 3-5-1- Collaborator’s role

The ARIA programme includes over 300 members and AIRWAYS ICPs includes 445 members. The paper describing AIRWAYS ICPs proposal is co-authored by 250 members (all stakeholders: health care professionals, social carers, patients, government officers, methodologists, etc) (3). All of the members are very committed to the implementation of AIRWAYS ICPs. National and regional groups have been initiated in all but 2 EU countries. In EU countries where health care is regionalised (59), many regional groups are in place.

#### 3-5-2- Role of scientific societies

AIRWAYS ICPs is in line with the mission and vision of scientific societies which aim to (i) promote research, (ii) collect, assess and diffuse scientific information, (iii) represent a scientific reference body for other scientific, health and political organisations and an advocate towards political organisation and the general public, (iv) encourage and provide training, continuous education and professional development and (v) collaborate with patients and lay organisations in the area of their field in order to lead the way towards better understanding, prevention, management and eventual cure of diseases. The European Academy of Allergy and Clinical Immunology (EAACI), the European Respiratory Society (ERS), the European Rhinology Society (ERS), the European Union Geriatric Medicine Society (EUGMS), the International Academy of Pediatrics and the International Primary Care Respiratory Group (IPCRG) are the major societies in Europe of their respective field and are all members of AIRWAYS ICPs. A recent meeting on precision medicine in airways and allergic diseases was held at the EU Parliament with these societies (77, 78). The activities of IPCRG are summarized in Supplement 1).

#### 3-5-3- Role of patient’s organisations

The goal and rationale of patient involvement in medical decisions is patient empowerment. Empowered patients know their disease. Patient empowerment commences with the initial consultations at the primary care level encompassing discussions about the patient’s ideas, concerns and expectations coupled with patient education about the specific disease process, what can be done to ameliorate the disease and ultimately self-management. Patients have the skills and motivation to take good care in their everyday life, to adjust their treatment and are prepared for new or potentially exacerbating situations. They are able to detect side-effects, contact healthcare professionals when necessary and they adhere to the treatment regime. Many tools support empowerment, shared decision making models and patient education. Patient empowerment should be included in the health care professional’s curriculum. For an optimal dissemination of good practices, there is a need for patient involvement and empowerment.

There are recommendations to secure patient organization/patient involvement at national (e.g. The Netherlands ZonMW) and also at EU level (79, 80).



EFA (European Federation of Allergy and airways diseases patient’s association), the major patient’s organisation for respiratory and allergic diseases in Europe has been very active for AIRWAYS ICPs (77, 78).

### 3-5-4- Diffusion of Good Practices

All EU countries should be included.

The European Geriatric Medicine, the official organ of the European Union Geriatric Medicine Society (EUGMS), has initiated a column of the EIP on AHA to publish important activities of the EIP on AHA to inform the medical community (2). Several papers have already been published (2, 29, 44, 81-85).

- **Reference Site Network:** The Reference Site Network is already committed to AIRWAYS-ICPs (decision taken during the Montpellier meeting).
- **Action Groups:** Area 5 of Action Group B3 is leading AIRWAYS ICPs.
  - **Event and dedicated scaling up / twinning sessions.** Several events have already taken place (Table 7).

**Table 7: AIRWAYS ICPs 2014 events**

Date	Location	Event and goals
27-02	Newcastle (UK)	Launch of AIRWAYS ICPs by Dr. M Bewick, Deputy National Medical Director of NHS England, (12)
12-05	Athens (Greece)	AIRWAYS ICPs was presented to the EIP on AHA.
09-06	Copenhagen (Denmark)	European Academy of Allergy and Clinical Immunology (EAACI). A symposium was organized (1,000 participants) and a working meeting held immediately after: AIRWAYS ICPs and MACVIA-ARIA (26)
17-08	Bahia (Brazil)	WHO GARD annual meeting. Presentation of AIRWAYS ICPs and MACVIA-ARIA to the GARD members and WHO. Acceptance of AIRWAYS ICPs to strengthen the 2013-2020 NCD WHO Action Plan (86)
16-09	Rotterdam (NL)	Annual meeting of the European Union Geriatric Medicine Society (EUGMS): Presidential lecture on AIRWAYS (T Strandberg, President of the Society).
09-10	Dubrovnik (Croatia)	Annual meeting of the Croatian Respiratory Society AIRWAYS ICPs and MACVIA-ARIA were presented (M Niculinic, President of the Society).
16-10	Rome (Italy)	The Italian Presidency of the EU Council has made CRDs one of the priorities. A GARD Italy meeting was held at the MOH. AIRWAYS ICPs was presented among other projects to be included in the Priority (87).
20-10	Montpellier (France)	The Region Languedoc Roussillon (in collaboration with the region North England and the EIP on AHA Reference Site Collaborative Network) has invited one member from each Reference Site to scale up AIRWAYS ICPs. The Collaborative Network has decided to include AIRWAYS ICPs in its priorities for scaling up and implementation (M Bewick, R Pengelly, Secretary of State of Northern Ireland) (28, 29).
05-11	Salzburg (Austria)	Annual meeting of the Austrian Allergy Society.
07-11	Guangzhou (China)	Annual meeting: Discussion for the deployment of AIRWAYS ICPs and MACVIA-ARIA in China (NS Zhong, former President of the Chinese Medical Association) (88).
20-11	Oslo (Norway)	Commitments for Action Oslo, Helsinki and Montpellier (K Lodrup Carlsen, T Haahtela, JB). The agreement for the deployment of the Finnish Allergy Programme in Norway was discussed at the MOH (43).

- **Network of excellence centers in respiratory and allergic diseases:** It includes the Commitments for Action (EIP AHA action Plan B3), Reference Sites of the EIP AHA, the GA<sup>2</sup>LEN network, members of AIRWAYS ICPs. The Global Allergy and Asthma European Network (GA<sup>2</sup>LEN), a

Sixth EU Framework Program for Research and Technological Development (FP6) Network of Excellence, was created in 2005 as a vehicle to ensure excellence in research bringing together research and clinical institutions to combat fragmentation in the European research area and to tackle allergy in its globality (89). The GA<sup>2</sup>LEN network has benefited greatly from the voluntary efforts of researchers who are strongly committed to this model of pan-European collaboration. The network was organized in order to increase networking for scientific and clinical projects in allergy and asthma around Europe.

### **3-6- Implementation, key success factors and lessons learnt**

#### **3-6-1- Planning and initiating the service**

- **Needs for AIRWAYS ICPs**, in particular in old age adults and co-morbid diseases, are clear. AIRWAYS ICPs was developed following the research priorities set by WHO on CRDs (90).
- **The strategy, the road map and the first implementation results** have been published (4).
- **ICPs for asthma have been shown to be highly cost-effective** in different settings (15, 35). Studies in developed and developing countries have shown a cost-effective reduction of hospitalisations and mortality.

#### **3-6-2- Setting up a system for change**

- **Good understanding:** The members of ARIA, GARD or AIRWAYS ICPs have perceived the need for the innovation, and consider it beneficial and congruent with central ideas and concepts. Deployment has been made to all stakeholders including patients and citizens. The results of the ARIA, GARD initiatives are clear (13, 46, 91-98). Since the same methodology is used for AIRWAYS ICPs enhanced by the EIP on AHA scaling up strategy, there is no reason for a lack of understanding. The present paper has been co-authored by over 450 authors from 72 countries in order to enhance understanding for different cultures, settings, health systems and languages.
- **Implementation of emerging technologies for predictive and personalised medicine.** Systems medicine is an emerging discipline (18, 77, 78, 99), which combines high-throughput analyses of all human genes and their products, with computational, functional and clinical studies. The aim is to gain detailed understanding of disease mechanisms, and how they vary between different patient groups. This understanding can be exploited for predictive and personalised medicine, according to guidelines proposed by the European Commission (<https://www.casym.eu>). The first implementations may reach the clinic within the next five years, for serious diseases that require costly treatments (100).
- **Political endorsement:** Several meetings have been organised by the EU. In particular, the Polish Priority of the EU Council (7, 8) which “WELCOMES existing networks and alliances, such as the Global Allergy and Asthma European Network (GA<sup>2</sup>LEN) and Global Alliance against Respiratory Diseases (GARD)”, In para 19, 20 and 21 there are recommendation: to give appropriate consideration to the prevention, early diagnosis and treatment, strengthen cooperation with relevant stakeholders, exchange best practices, support national centres and existing international research networks to find cost-effective procedures by using health technology assessment to improve health care systems standards regarding to chronic respiratory diseases, consider the use of e-Health tools and innovative technologies for prevention, early diagnosis and treatment of chronic respiratory diseases, and finally - support Member States by EU Commission in developing and implementing effective policies, improving networking among institutions responsible for the implementation of programmes.”

A meeting at the EU Parliament under the leadership of the Cyprus Presidency of the EU Council (10) and a GARD meeting at the Italian Ministry of Health during the Presidency of the EU Council reinforced the importance of CRDs for their early detection and management to improve AHA. The present document has been presented at a meeting in Lisbon, Portugal (July 1-2, 2015) organised by the Reference Site Network of the EIP on AHA in collaboration with EU regions and the Directorate General of Health.

MACVIA-LR is supported by a strong political endorsement at the regional level. ARIA has been adopted by several governmental policies. AIRWAYS ICPs has been launched in collaboration with NHS England, Scotland, Northern Ireland, the MOH of Portugal, Poland and Lithuania and several governments of EU regions (e.g. Emilia Romagna, Basque Country).

- **Engagement of relevant stakeholders:** In ARIA, GARD and AIRWAYS ICPs, all relevant stakeholders have been included and are highly motivated: health care professionals (physicians, pharmacists, nurses, physiotherapists and others), social workers, policy makers. A special effort has been attempted for patient empowerment. An EU Parliament session led by EFA, the largest European patients' organisation in asthma and airway diseases, has been organised in collaboration with MeDALL (FP7 project) (36, 37), in May 2015. Professional societies and groups should be enlisted as active collaborators in order to enhance and even drive uptake at the country level.
- **Financial viability and business model:** It has been shown that the implementation of the Finnish national plans, ARIA and GARD does not require large resources. However, AIRWAYS ICPs will require arrangements for the reimbursement of the services.

### 3-6-3- Organisational process and design choices

- **Investing in human capital:** Training and reskilling the work force is an essential and fundamental component of AIRWAYS ICPs. This may require initial and continuing investment to ensure that the workforce possess the appropriate knowledge, skills and equipment to fulfil their roles, as show by some very successful ARIA and GARD initiatives. AIRWAYS ICPs should shall go a step further, however, and be fully implemented countrywide. The EIP on AHA Reference Site Network has offered its help. The present paper has been co-authored by many professional leaders from over 70 countries to build a global momentum.
- **Integrating ICT solutions:** Telemedicine represents a possible specific advanced tool of ICT in CRDs management and secondary prevention. ICT solutions are integrated to support AIRWAYS ICPs implementation and the MACVIA-ARIA sentinel network was launched in Copenhagen (June 9, 2014). A CDSS is being built and should be available at the end of the year. This system may form the prototype for a more complex one for asthma, COPD, other CRDs and co-morbidities.
- **Organisational changes:** Currently under discussion but will require flexibility in order to adapt to the needs of different areas.

### 3-6-4- Monitoring, evaluation and dissemination

These activities have been initiated by ARIA and GARD at the international level, but they are also part of the national and regional plans for CRDs. The Area 5 programme on CRDs will benefit from previous expertise, successes and failures to propose refined and updated activities.

- **Assessment indicators:** In asthma and COPD, hospitalisation rates and mortality are two indicators of interest and are responsive to change within 2-3 years. In rhinitis, these indicators cannot be used. Control is applicable to asthma, COPD and/or rhinitis and quality of life is applicable to all 3 diseases. An economic evaluation was found to be effective in asthma in many countries (40, 74).
- **Mutual learning:** Learning Networks for learning and sharing best practices are in place for CRDs. Scientific societies and patient's organisations are of importance in the process.
- **Dissemination activities:** One of the strengths of ARIA and GARD, and also already AIRWAYS ICPs, is the great ability to disseminate information and guidelines in countries, in the EU and globally.
- **Scaling up of the new good practices:** Another strength of ARIA and GARD is the capacity to scale up good practices in countries, in the EU and elsewhere

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**Supplement 1: IPCRG scaling up activities**