ERS Congress 2025: highlights from the Allied Respiratory Professionals Assembly

Dimitrios Alefragkis [1,9], Pierre Cnockaert [2,9], Markus Hayden [3,9], Emma Raywood [4,9], Chris Burtin [5], Jellien Makonga-Braaksma [6] and Heleen Demeyer [7,8]

[1]Department of Nursing, School of Health Sciences, National and Kapodistrian University of Athens, Athens, Greece. [2]Institut de Recherche Expérimentale et Clinique, Pôle de Pneumologie, ORL et Dermatologie, Université Catholique de Louvain, Brussels, Belgium. [3]Klinik Bad Reichenhall der DRV Bayern-Süd, Bad Reichenhall, Germany. [4]UCL Great Ormond Street Institute of Child Health, London, UK. [5]REVAL Rehabilitation Research Center, Faculty of Rehabilitation Sciences, BIOMED-Biomedical Research Institute, Hasselt University, Diepenbeek, Belgium. [6]Team Stafadviseurs Digitalisering, Meander Medisch Centrum, Amersfoort, the Netherlands. [7]Department of Rehabilitation Sciences, KU Leuven, Leuven, Belgium. [8]Department of Rehabilitation Science, Ghent University, Ghent, Belgium. [9]These authors contributed equally.

Corresponding author: Heleen Demeyer (heleen.demeyer@ugent.be)

Shareable abstract (@ERSpublications)
This article presents key insights from the 2025 #ERSCongress as observed by Early Career Members of the Allied Respiratory Professionals Assembly @ERS_Assembly9 https://bit.ly/4amfzwg

Cite this article as: Alefragkis D, Cnockaert P, Hayden M, *et al*. ERS Congress 2025: highlights from the Allied Respiratory Professionals Assembly. *ERJ Open Res* 2026; 12: 01706-2025 [DOI: 10.1183/23120541.01706-2025].

Received: 15 Dec 2025
Accepted: 22 Jan 2026

The theme of the 2025 European Respiratory Society (ERS) Congress was “Respiratory health around the globe”, with a focus on the global burden of respiratory disease, the challenges faced in respiratory health worldwide, and global solutions to improve respiratory health.

This article presents the highlights experienced by the early career members of the Allied Respiratory Professionals (Assembly 9). Written by one early career member from each assembly group, these highlights offer insights from respiratory function technologists (group 9.1), physiotherapists (group 9.2), nurses (group 9.3) and behavioural scientists and psychologists (group 9.4), showcasing the multidisciplinary nature of our assembly.

Topics are grouped under the themes “Challenges of chronic respiratory disease management” and “Integrating digital health and human factors in respiratory care”. These themes and their content originate from presentations and discussions that attracted the attention of early career members of our assembly. The content is based on a combination of published data discussed during symposia, as well as new insights from abstract presentations.

Challenges of chronic respiratory disease management

The care of people with chronic respiratory diseases (CRD) presents several challenges. Therefore, practical, patient-focused solutions are required that account for comorbidities, the environment and access to treatment are required to provide better support for people living with respiratory conditions everywhere. Several of these challenges were discussed during the 2025 ERS Congress.

First, difficulties in managing CRD may arise from both non-respiratory comorbidities and the underlying disease severity, as highlighted in several abstracts presented. Patients with CRD often present with comorbidities including metabolic dysfunction, cognitive impairment and urinary incontinence, which can further complicate care pathways. Metabolic dysfunction in COPD is characterised by distinct alterations in oxidative stress and energy metabolism pathways [1]. Cognitive impairment affects a significantly higher proportion of people with COPD compared with healthy controls (51% *versus* 24%) and leads to deficits in processing speed, executive function, memory, and visual processing [2]. The presence of this comorbidity appears to be influenced by factors such as age, illiteracy, and exposure to air pollutants [3].

Urinary incontinence, reported in 38% (95% CI 32–44%) of patients attending pulmonary rehabilitation (PR), is associated with poorer quality of life and greater fatigue [4, 5]. Its presence may also negatively affect participation and adherence to PR [4]. Therefore, management strategies need to be adapted in patients with a high disease burden.

During her presentation "Practical issues in exercise training in severely impaired patients" (in the mini symposium "Exercise training in severely impaired patients"), T. Schneeberger (Schönau am Königssee, Germany) highlighted that both pharmacological (*e.g.* supplemental oxygen) and non-pharmacological therapies (*e.g.* exercise training) should be tailored to the patient's needs. An article published in 2023 describing a recommendation for exercise training based on expert consensus stated that pharmacological therapy should be optimised, followed by assessment of the patient's exercise capacity, before initiating endurance training [6]. Regarding the pharmacological therapy, Schneeberger highlighted that careful patient assessment and selection of the oxygen delivery strategy are essential, knowing that both fixed oxygen flows and an addition to the resting titrated flow can limit exercise tolerance, sometimes leading to early termination. In patients with COPD, automatic oxygen flow systems improve endurance, with a significantly greater walking distance than with constant flow (465 *versus* 310 m, $p<0.001$) [7]. However, with on-demand oxygen delivery systems, 20% of patients experienced a peripheral oxygen saturation reduction of 4% or more during the incremental shuttle walk test, highlighting potential triggering issues in some patients [8]. Regarding exercise training, which is one of the recommended non-pharmacological treatments for CRD, interval training is often suggested for those with more severe limitations. The latter provides similar improvements in exercise capacity with better tolerance than continuous training [9]. Among adjunct strategies, non-invasive ventilation [10] and high-flow therapy [11] can further support exercise performance in those who are most severely impaired.

Second, the long-term management of CRD is necessary and presents additional challenges, as discussed in several abstracts presented. Focusing on exercise training, many patients are unable to maintain the benefits achieved after PR. Repeated PR programmes may be a solution to improve patient-relevant outcomes [12]. Once PR programmes end, interventions sustaining engagement in physical activity (PA) are crucial for preserving benefits. A personalised, community-based PA programme demonstrated its ability to prevent PA decline [13] and provided insights into behavioural change techniques for maintaining activity. These strategies can be grouped into five intervention types: education (*e.g.* health information), training (*e.g.* habit formation), persuasion (*e.g.* reassurance regarding capabilities), environmental restructuring (*e.g.* social environment adjustments) and enablement (*e.g.* goal setting) [14]. In long-term management, palliative care also needs attention. Semi-structured interviews with patients with end-stage COPD identified three key needs: home-based healthcare, management of dyspnoea and anxiety, and emergency planning. Barriers included lack of information on progression and prognosis, as well as misunderstanding of palliative care [15]. In addition, exploration of cultural factors is critical, as they influence several aspects of care such as symptom-reporting and decision-making. End-of-life care should be culturally sensitive while avoiding stereotyping, as highlighted by S. Bajwah (London, UK) during her talk titled "Cultural differences in palliative care for patients with interstitial lung diseases", in the symposium entitled "Interstitial lung diseases around the world".

Third, in line with the conference's theme "Respiratory health around the globe", a patient's environment can be a barrier to effective disease management. A patient testimony was shared by N. Morgan (Shipton-under-Wychwood, UK) during the symposium "Holistic yet personalised self-management of chronic respiratory diseases worldwide". N. Morgan lives with asthma and bronchiectasis and is an advocate for her own condition and the impact of exercise. Her perspective emphasised the need for a holistic approach; care must address not only the CRD but consider the person's living context to personalise advice and support self-management. As part of the same symposium, T. Effing-Tijdhof (Adelaide, Australia) summarised the challenges to CRD management across five levels (figure 1). For instance, at the patient level, health literacy can influence self-management and adherence to treatments [16]. At the community and family level, poverty represents a major challenge, with 40–80% of people in low-resource countries living on less than USD 1.25 per day, thereby limiting access to treatment [17]. At the healthcare provider level, global guidelines may be difficult to implement as they are often not tailored to local needs and resources [18]. At the healthcare system level, the availability and affordability of medications can pose significant barriers [19]. Finally, at the intervention level, increased complexity of care may present challenges if interventions were developed in high-income countries and are not directly applicable globally without adaptations [20]. Another critical consideration regarding the patient's environment is the prevalence of misinformation, as discussed by H. Maisonneuve (Lyon, France) as part of a "hot topics" session entitled "Fighting global threats to respiratory health: how to make a difference". The World Economic Forum's 2025 Global Risk Report projected that over the following 2 years,

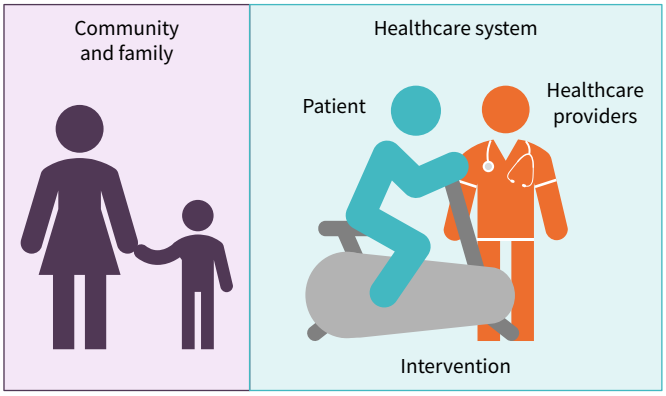

FIGURE 1 Different levels of challenges for the self-management of chronic respiratory diseases (based on the presentation provided by T. Effing-Tijdhof). This figure has been designed using resources from Flaticon.com.

misinformation and disinformation will be the first global short-term risk, ahead of climate events and armed conflicts [21]. Strategies to mitigate this threat include effective science communication at the societal level, as well as assessing individual beliefs and implementing "prebunking" interventions (*i.e.* interventions designed to reduce susceptibility to future misinformation) and "debunking" interventions (*i.e.* interventions aimed at rectifying misinformation) [22].

Fourth, especially within a global context, the challenges in the use of "normal" values for testing and interpretation received attention during the 2025 ERS Congress. The ERS Global Lung Function Initiative (GLI) task force reported cardiopulmonary exercise testing (cycle ergometer or treadmill) GLI reference data [23]. The task force reported large variations in data collection protocols and reporting across the 17 sites contributing data; this precluded the development of a single all-age cardiopulmonary exercise testing reference equation. Highlighting the importance of standardisation of protocols and collaboration for analysis going forward. The challenges with defining and using normal values were also discussed for lung function results. Algorithms including structural and functional measures may be more useful distinguishing health from obstructive lung disease in patients with diagnostic uncertainty when using either the forced expiratory volume in 1 s to forced vital capacity lower limit of normal or a fixed ratio alone [24], or using a first-percentile or lower survivable limit (forced expiratory volume in 1 s quotient) rather than a "normal" value for comparison [25]. Alternatively, a retrospective analysis of data from patients with interstitial lung disease with normal spirometry identified that a supranormal peak expiratory flow could be a novel indicator of disease progression and survival [26].

Integrating digital health and human factors in respiratory care

Digital transformation is redefining healthcare delivery across all medical fields, including respiratory medicine. A wide range of tools (such as artificial intelligence (AI), telemedicine, remote monitoring and online health communities) offer new opportunities for early diagnosis, proactive disease management, and greater patient participation (figure 2). These innovations aim to improve self-management, adherence, and clinician–patient communication. However, effective implementation requires not only technological progress but also adaptable healthcare systems, professional training, and active involvement of patients and families. Understanding how these elements interact is key to developing more integrated, patient-centred respiratory services for the digital era. In this section, several contributions from the 2025 ERS Congress will be highlighted that exemplify current developments and research of particular relevance within this context.

A retrospective study examined the use of AI to identify patients with COPD and those at increased risk of exacerbation, following the Global Initiative for Chronic Obstructive Lung Disease recommendations [27]. 300 patients were divided into diagnostic categories, and the AI assessments were compared with clinician assessments. The system achieved a high sensitivity of 100% and an accuracy of 95% in confirming COPD and distinguishing diagnostic subgroups, maintaining consistent performance when validated in a larger group of 29 339 intensive care unit patients, with an accuracy of 87.9%. The study highlights the potential of AI to assist in early case identification and guideline-based care, although broader clinical integration and continued validation remain necessary for its effective use.

FIGURE 2 Integrating digital health and human factors in respiratory care. AI: artificial intelligence. This figure has been created using ChatGPT.

A Danish feasibility study investigated life-logging, combining wearable cameras and biometric wristbands for continuous real-world monitoring among patients recently hospitalised for COPD exacerbations [28]. Despite the participants' advanced age and disease burden, 70% of those approached consented to participate, suggesting general acceptability. Nonetheless, usability challenges such as device discomfort, improper usage, and minor skin irritation were frequent. These findings indicate that while life-logging holds promise for capturing ecologically valid behavioural and physiological data, its successful application depends on device refinement and structured patient guidance. Complementary qualitative research on TeleCOPD, a national telemonitoring programme, further underscored the influence of social and individual resources on technology engagement [29]. Drawing on Bourdieu's capital theory, which conceptualises individuals' access to social, cultural, and symbolic resources that shape their capacity to act within a given field, the study illuminated how differing forms of "health capital" influence patients' engagement with digital care. Three patient archetypes exemplified these distinctions: the "Health Enthusiast", who possesses substantial health-related knowledge, confidence, and agency; the "Pragmatic", who engages selectively based on perceived usefulness and available resources; and the "Disease-oriented" patient, whose limited health capital manifests in passive health behaviours and reliance on external direction. A key insight was a mismatch between the standardised telemonitoring framework and the heterogeneous needs and motivations of patients, potentially reinforcing rather than mitigating health inequities. These results emphasise the necessity of individualised, context-sensitive telehealth designs to ensure equitable implementation.

Respiratory virtual wards are models of care that enable patients to receive hospital-level monitoring and treatment in their own homes, supported by remote clinical oversight and digital health technologies. An audit of the utilisation of the Royal London Hospital Respiratory Virtual Ward, established in January 2024 to support patients with acute exacerbations of CRD, was presented at the 2025 ERS Congress [30]. The clinical activity audited from January to November 2024 resulted in 439 recorded admissions. The majority of admissions were in patients with COPD (70.8%), followed by bronchiectasis (12.8%), interstitial lung disease (7.1%), and asthma (8.9%). The virtual room prevented 277 hospital admissions and enabled 162 early discharges, resulting in a total of 3217 hospital days saved. Only 10% of patients with COPD were readmitted within 28 days, compared with the national average of 33%. Overall, the results suggest that a virtual respiratory ward can safely relieve pressure on hospital beds while supporting comprehensive hospital-level care delivered in the community.

A quasi-experimental study assessing pre-consultation podcasts in respiratory outpatient clinics found that, although overall participation slightly declined, patients who received podcasts expressed significantly more preferences and fewer concerns during consultations [31]. This pattern suggests a shift toward more focused, preference-oriented communication, implying that multimedia pre-consultation materials may enhance preparedness and facilitate structured, patient-centred dialogue.

A qualitative study explored patients' and clinicians' experiences of a primary care–based digital intervention designed to promote engagement with an online health community for adults with asthma [32]. The intervention, co-developed with patients and primary care clinicians, was evaluated in six practices in East London as part of a 3-month non-randomised feasibility study. Semi-structured interviews took place with 12 patients and five nurses involved in delivering or receiving the intervention. Both groups found promotion of online peer support and sign-up *via* primary care acceptable and feasible, with the reported benefits including easier access to health information and improved self-management awareness. Findings will inform development of a future randomised controlled trial to assess refinement of the intervention and its effectiveness and cost-efficiency.

In interstitial lung disease, a multicentre mixed-methods study explored how illness perceptions and expectations affect adherence to antifibrotic treatment, oxygen therapy, and noninvasive ventilation [33]. Adherence rates were moderate (approximately 60–70%), and qualitative analysis identified four overarching themes: disease perception, knowledge, therapeutic relationship, and future expectations. Notably, adherence was not significantly associated with cognitive illness beliefs, suggesting that emotional and relational dimensions, rather than purely cognitive appraisals, are central to sustaining treatment engagement.

A national survey in New Zealand applied the short-acting β_2-agonist (SABA) Reliance Questionnaire (SRQ) to examine treatment beliefs underlying SABA over-reliance in asthma [34, 35]. High SRQ scores were associated with poor asthma control and low adherence to inhaled corticosteroids. Beyond screening, the SRQ serves as an educational tool whose items can be discussed directly with patients to address specific misconceptions. This approach enables targeted behavioural interventions that help patients modify reliance patterns and promote safer, more effective asthma management.

Home-based monitoring has now become more accessible and more often included in the care of patients (*e.g.* home spirometry, PA monitoring). Y. Khor (Melbourne, Australia) presented the current status of home-based monitoring for CRD in detail during the "Digital monitoring for clinical care and decentralised trials" studio session. The talk explained the PANACEA framework. This framework includes seven domains to assess the degree to which home-based monitoring assessments meet the conditions for clinical and research use in chronic lung disease. The domains included are 1) test performance; 2) disease management; 3) cost; 4–6) experience for the patient, clinician and researcher; and 7) access [36]. Monitoring from a distance might also increase global access to health. The benefits and challenges with decentralised trials were presented during the same studio session by P. Alupo (Kampala, Uganda), highlighting improved patient accessibility and recruitment as key advantages, alongside challenges related to data quality, digital infrastructure and regulatory requirements.

These studies collectively highlight the growing role of digital innovation in respiratory care, encompassing AI, telemonitoring, virtual wards, wearable sensors and patient education tools. When aligned with patients' beliefs, capacities, and daily realities, such technologies can enhance early detection, coordination and engagement across care settings. Addressing usability challenges, personalisation needs, and psychosocial context remains essential to translating these advances into lasting improvements in respiratory health. Continued evaluation and thoughtful integration of digital tools will be crucial to achieving equitable, effective, and patient-centred care in the digital era.

Acknowledgement: ChatGPT has been used to improve language and readability of parts of the manuscript and to create figure 2. The authors take full responsibility for the content of the publication.

Provenance: Commissioned article, peer reviewed.

Conflict of interest: H. Demeyer is the early career representative of Assembly 9. C. Burtin and J. Makonga-Braaksma are the current secretary and head of the same assembly, respectively. The authors do not report any conflict of interest related to the article. All other authors report no conflicts of interest.

References

1 Machado M, Garcia JP, Callegari M, *et al.* Metabolic changes in COPD: a comparative metabolomic approach with healthy individuals. *Eur Respir J* 2025; 66: Suppl. 69, PA3620.

2 Jakobsson J, Cops D, Westman J, *et al.* Multi-domain cognitive function in COPD and matched controls: baseline data from the COPD-HIIT randomised controlled trial. *Eur Respir J* 2025; 66: Suppl. 69, OA6462.

3 Ahmad T, Arman A, Ganeshan D. Cognitive impairment in patients with COPD. *Eur Respir J* 2025; 66: Suppl. 69, PA1447.
4 Parrot D, Laporte F, Bocquet L, *et al.* Urinary incontinence is common among people with chronic respiratory disease attending pulmonary rehabilitation and may reduce adherence – a multicenter cross sectional study. *Eur Respir J* 2025; 66: Suppl. 69, PA2772.
5 Pauwels E, De Soomer K, Crokaert B, *et al.* Prevalence of urinary incontinence in a Belgian pulmonary rehabilitation cohort. *Eur Respir J* 2025; 66: Suppl. 69, PA2785.
6 Gloeckl R, Zwick RH, Furlinger U, *et al.* Prescribing and adjusting exercise training in chronic respiratory diseases – expert-based practical recommendations. *Pulmonology* 2023; 29: 306–314.
7 Schneeberger T, Jarosch I, Leitl D, *et al.* Automatic oxygen titration *versus* constant oxygen flow rates during walking in COPD: a randomised controlled, double-blind, crossover trial. *Thorax* 2023; 78: 326–334.
8 Gloeckl R, Jarosch I, Schneeberger T, *et al.* Comparison of supplemental oxygen delivery by continuous *versus* demand based flow systems in hypoxemic COPD patients – a randomized, single-blinded cross-over study. *Respir Med* 2019; 156: 26–32.
9 Gloeckl R, Halle M, Kenn K. Interval *versus* continuous training in lung transplant candidates: a randomized trial. *J Heart Lung Transplant* 2012; 31: 934–941.
10 Schneeberger T, Dennis CJ, Jarosch I, *et al.* High-intensity non-invasive ventilation during exercise-training *versus* without in people with very severe COPD and chronic hypercapnic respiratory failure: a randomised controlled trial. *BMJ Open Respir Res* 2023; 10: e001913.
11 Cirio S, Piran M, Vitacca M, *et al.* Effects of heated and humidified high flow gases during high-intensity constant-load exercise on severe COPD patients with ventilatory limitation. *Respir Med* 2016; 118: 128–132.
12 Mohammed J, Houben-Wilke S, Groenen M, *et al.* Effectiveness of repeated pulmonary rehabilitation in patients with COPD. *Eur Respir J* 2025; 66: Suppl. 69, OA6460.
13 Rebelo P, Brooks D, Cravo J, *et al.* Beyond pulmonary rehabilitation: can the PICk UP programme fill the gap? A randomised trial in COPD. *Pulmonology* 2025; 31: 2416827.
14 Rebelo PFS, Brooks D, Marques A. Supporting a physically active lifestyle in COPD: lessons from the PICk UP study. *Eur Respir J* 2025; 66: Suppl. 69, PA2792.
15 Schmidt-Stiedenroth K, Salandi J, Schmidt A, *et al.* Palliative care needs of patients with end-stage COPD and their informal caregivers. *Eur Respir J* 2025; 66: Suppl. 69, PA6009.
16 Easton P, Entwistle VA, Williams B. Health in the 'hidden population' of people with low literacy. A systematic review of the literature. *BMC Public Health* 2010; 10: 459.
17 Morgan GW, Foster K, Healy B, *et al.* Improving health and cancer services in low-resource countries to attain the Sustainable Development Goals target 3.4 for noncommunicable diseases. *J Glob Oncol* 2018; 4: 1–11.
18 Tabyshova A, Hurst JR, Soriano JB, *et al.* Gaps in COPD guidelines of low- and middle-income countries: a systematic scoping review. *Chest* 2021; 159: 575–584.
19 Stolbrink M, Thomson H, Hadfield RM, *et al.* The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review. *Lancet Glob Health* 2022; 10: e1423–e1442.
20 Clark J, Salins N, Sherigar M, *et al.* BREATHLEssness in INDIA (BREATHE-INDIA): realist review to develop explanatory programme theory about breathlessness self-management in India. *NPJ Prim Care Respir Med* 2025; 35: 13.
21 Elsner M, Atkinson G, Zahidi S. Global Risks Report 2025. Geneva, World Economic Forum, 2025. www.weforum.org/publications/global-risks-report-2025/digest/
22 Van Der Linden S, Albarracín D, Fazio L, *et al.* Using psychological science to understand and fight health misinformation: an APA consensus statement. *Am Psychol* 2025; in press [https://doi.org/10.1037/amp0001598].
23 Radtke T, Chávez L, Duggan L, *et al.* Global lung function initiative reference values for cardiopulmonary exercise testing. *Eur Respir J* 2025; 66: Suppl. 69, OA5395.
24 Yabar D, Duggan L, Collins S, *et al.* A novel approach to differentiate obstructive lung disease from health. *Eur Respir J* 2025; 66: Suppl. 69, PA5195.
25 Björklund F, Palm A, Sundh J, *et al.* A lung function threshold for survival? - FEV1Q and mortality in patients with chronic respiratory failure. *Eur Respir J* 2025; 66: Suppl. 69, PA2448.
26 Shotton W, Knox-Brown B, Sylvester K. Supranormal peak flow in ILD. *Eur Respir J* 2025; 66: Suppl. 69, PA2044.
27 Veldman A, El Khoury J, Feigler N, *et al.* Artificial intelligence and clinical guidelines to find at-risk COPD patients for treatment optimisation. *Eur Respir J* 2025; 66: Suppl. 69, PA6266.
28 Farver-Vestergaard I, Salgado S, Munkholm Møller D, *et al.* Exploring the acceptability and usability of 'life-logging' methodology in respiratory research. *Eur Respir J* 2025; 66: Suppl. 69, OA3415.
29 Smorawski G, Farver-Vestergaard I, Fersch B, *et al.* Telemonitoring in COPD: a qualitative study of patients' needs and requirements. *Eur Respir J* 2025; 66: Suppl. 69, PA1675.

30 Patel K, Olajide D, Rodriguera M, *et al.* Delivering a respiratory virtual ward: an audit of utilisation. *Eur Respir J* 2025; 66: Suppl. 69, PA6265.
31 Frølund J, Løkke A, Jensen HI, *et al.* Podcasts as a tool to support patient participation in hospital consultations: an intervention study. *Eur Respir J* 2025; 66: Suppl. 69, OA3409.
32 Karampatakis GD, Wood H, Li X, *et al.* Experiences of a primary care intervention promoting use of an online health community (OHC) for adults with troublesome asthma: qualitative interview study. *Eur Respir J* 2025; 66: Suppl. 69, PA746.
33 Volpato E, Buscemi AAMD, Mantero M, *et al.* Impact of illness perceptions and expectations on adherence in interstitial lung diseases: a mixed-methods multicenter study. *Eur Respir J* 2025; 66: Suppl. 69, OA3410.
34 Chan AHY, Katzer CB, Horne R, *et al.* SABA Reliance Questionnaire (SRQ): identifying patient beliefs underpinning reliever overreliance in asthma. *J Allergy Clin Immunol Pract* 2020; 8: 3482–3489.e1.
35 Foot H, Ning R, Bruce P, *et al.* Examining SABA over-reliance in individuals with asthma. *Eur Respir J* 2025; 66: Suppl. 69, OA3411.
36 Khor YH, Poberezhets V, Buhr RG, *et al.* Assessment of home-based monitoring in adults with chronic lung disease: an Official American Thoracic Society Research Statement. *Am J Respir Crit Care Med* 2025; 211: 174–193.