EDITORIAL

Directing the future of lung health: the *European Respiratory Roadmap*

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One of the missions of the European Respiratory Society (ERS) is to raise public and political awareness of lung disease. A major initiative to help achieve this goal was the 2010 Year of the Lung; a year dedicated to promoting lung health. A particular highlight of the year was a global lung function testing event, the first-ever World Spirometry Day which was held on October 14, 2010 [1]. Another major initiative was the ERS pre-ministerial conference on “Chronic respiratory diseases – exploring solutions in the EU” held on October 19, 2010, in partnership with the Belgian presidency of the Council of the EU. The ERS was invited to present its recommendations on chronic diseases at the ministerial conference on October 20, 2010 [2]. The official Council conclusions reflected the collective efforts of the ERS to raise the profile of chronic diseases [3]. As a continuation and expansion of these actions, the ERS has embarked on the publication of the *European Respiratory Roadmap* [4].

“A roadmap provides an extended look at the future of a chosen field of inquiry composed from the collective knowledge and imagination of the brightest drivers of change in that field” [5]. The *European Respiratory Roadmap* (hereafter “roadmap”), the first of its kind, seeks to serve as a basis for the respiratory community to communicate with key decision and policy makers on the importance of a focused strategy for respiratory medicine. It aims to outline, in four main chapters, the future needs of respiratory medicine in terms of changes in clinical practice, patient empowerment, expected new models of care delivery, and prevention strategies. It highlights the major research challenges that still persist, and how the training and education of health professionals will need to change and adapt to meet the societal challenges of the next generation. The roadmap will be an on-going project that will gather and select content from all fields in respiratory care in Europe. It is available on the ERS website at www.ersnet.org/roadmap.

The development of the roadmap has been an 18-month exercise and has involved the entire ERS membership, composed of more than 11,000 professionals in over 100 countries, through the 11 different scientific Assemblies. It was further discussed during a respiratory summit in Leuven, Belgium, with input from a range of external experts, including other stakeholders from the pharmaceutical industry, patient organisations, public health experts, and policy and decision makers. The roadmap is entirely independent from external funding and is published by the ERS on behalf of the whole respiratory community.

Two versions of the roadmap will be launched in September 2011: a version for respiratory professionals at the ERS Annual Congress on September 24, 2011; and an abbreviated version for politicians and policy makers in the EU Parliament on September 6, 2011. Figure 1 shows a schematic representation of the major issues and actions identified by the roadmap, more details of which are provided in this editorial.

PREVENTION

The chapter of the roadmap on “Prevention” highlights key areas on preventative action to stem the rise of respiratory diseases. One of the main aims is to develop a communications strategy to draw public attention to the key points of lung health and disease. As part of this, it is important to form a consensus with all stakeholders on common respiratory terminology across Europe, and to join forces with other organisations and actors in forming coalitions to raise awareness.

With respect to the main health determinants, emphasis is placed on the need to: 1) accelerate full implementation of all aspects of the World Health Organization (WHO) Framework Convention on Tobacco Control [6], in particular a smoke-free Europe; 2) promote a stronger adherence by the EU member states to the WHO recommended air-quality guidelines for both indoor and outdoor air, as well as the Parma Declaration and the Commitment to Act 2010 [7]; 3) promote physical activity as a normal part of healthcare and encourage people with lung conditions to continue to exercise; and 4) recognise that respiratory diseases constitute a priority action in the context of an ageing population. More action is also needed in the field of occupational health, e.g. to promote the concept of exposure standards for allergens and respiratory irritants as a major primary prevention. As chronic lung disease is more prevalent in people in poverty and with health inequality [8], causes of poverty should be addressed and efforts should be made to provide social support and educational programmes

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FIGURE 1. a) Key issues and actions identified by the *European Respiratory Roadmap* and split into the four major themes. b) Future research priorities highlighted in the *European Respiratory Roadmap*.

for this sector. Resources tailored to this group will result in better uptake and increased patient treatment initiation and adherence.

Early detection and diagnosis of lung diseases leads to early treatment, and early treatment is an important step to reducing healthcare costs in the EU. Means of early detection, such as lung cancer screening and cystic fibrosis post-natal screening, should be widely and proactively implemented when proved to be beneficial. The roadmap underlines the need to establish a lung health check as part of general medical check-ups and at regular intervals. Spirometry is an important screening test for general respiratory health [9], but it should also be emphasised that impaired spirometry is one of the major indicators for cardiovascular disease. In addition, there is a need to develop tools that can detect lung disease in at-risk populations, such as novel imaging techniques and sleep studies. Particular attention should be given to children, in order to detect, diagnose and treat lung disease at its outset, as a link has been shown between early childhood and adult lung diseases, including severity [10].

Finally and importantly, we need to improve the content and quality of patient information by working in partnership with patient groups and the European Medicines Agency (EMA).

CLINICAL CARE

The "Clinical care" chapter covers the future challenges related to accessibility to care, affordability of care and the application of existing tools and care models. The use of managed clinical networks, multidisciplinary teams and collaborative efforts across the board of healthcare should be stimulated and funded by the Member States. The focus of chronic care models on advanced chronic conditions needs to be shifted toward addressing people in the early stages of chronic disorders. The ultimate aim should not be solely to manage disease, but to improve the prognosis.

Accessibility remains a key challenge in managing chronic respiratory disease. Tools and systems need to be activated

across the health system to change the current dismal state of affairs. There is a need to optimise the availability, accessibility and quality of pulmonary rehabilitation in Europe, especially since it is acknowledged as cost effective in patients with moderate-advanced COPD [11]. Presently, less than 5% of eligible patients have access to rehabilitation [12]. In addition, only 2–3% of those dying from non-malignant diseases currently access specialist palliative care [13]. Greater support from specialist nurses and specialist palliative-care teams is required.

Many technological innovations for diagnosis and treatment are expected to reach the clinic in the next decade. Some examples include video-assisted thoracic surgery, sensitive imaging techniques, use of tracer gases, regenerative medicine, nanoparticle-based inhalative drugs, personalised medicine, bronchioplasty, laser energy as a surgical tool and metabolic imaging techniques.

Other issues highlighted include the challenges faced in the field of organ donation. For the next decade there is a need to promote and better coordinate organ donation within Europe, as the need for donor organs by far exceeds the availability of donor lungs. The shortage of donor lungs is the main reason why only relatively few lung transplantations are performed every year, despite the effectiveness of this life-saving method in end-stage lung diseases (fig. 2) [14]. This may be due to the view of the general public that lung transplantation is the treatment of end-stage diseases for few people. The need for lung transplantation could also be reduced if the diseases resulting in the need for the procedure, *e.g.* cystic fibrosis and inflammatory diseases, were more effectively researched and efficiently treated.

All of these challenges cannot be achieved unless a suitable workforce is in place. A formidable challenge for curative medicine in the future will be the shortage of doctors and nurses to deal with the epidemic of respiratory diseases. It is expected that by 2020, the estimated shortage of healthcare workers, including physicians, nurses, dentists, pharmacists and physiotherapists, in Europe will amount to 1,000,000, leading to an absence of coverage of 15% of the necessary care [15].

FIGURE 2. Dynamics of the Eurotransplant heart and lung transplant waiting list and transplants, and lung transplant waiting list and transplants, 1991–2009. Reproduced from [14] with permission from the publisher.

RESEARCH

In the chapter on “Research”, the roadmap underscores its crucial role in making a direct contribution to the prevention and treatment of lung diseases and ultimately in dramatically increasing the quality of life for European citizens. Research into lung diseases has yielded many life-changing results, such as the development of new effective asthma treatment, the increased success of lung transplantations, better treatments of cystic fibrosis, as well as significant recent developments in new treatment approaches for pulmonary hypertension.

Despite the progress, there are a lot of gaps that need to be addressed. One of them is undoubtedly that not enough is being invested in research on respiratory diseases. Medical research is vital and the future national and European research programmes must reflect this to a greater extent. In 2002 in the UK, respiratory research only claimed 2.8% of the Medical Research Council budget, whereas 13% of the mortality in that year was due to respiratory diseases [16]. An analysis of the Seventh Framework Programme for Research and Technological Development (FP7, 2006–2013) demonstrated that, although respiratory research claimed a fairly generous 4.3% slice of the FP7 health budget totalling some €260 million, approximately only 0.5% was devoted to research in chronic obstructive pulmonary disease and asthma, *i.e.* €30 million (fig. 3).

To enable meaningful and effective research there is the need for mechanisms to ensure sustained rather than short-term funding. More translational research is needed as translation of new research findings into progress in medical practice remains a barrier [17]. There is a need to develop interdisciplinary centres of excellence in respiratory translational research. Better interaction between innovative academic centres and the pharmaceutical industry is essential for new drug development and public–private partnerships to stimulate new drug development, such as the Innovative Medicines Initiative (IMI) programme, are essential to move drug development forward. In the past 20 yrs, only nine new drugs have been developed by the pharmaceutical industry, thus leading to a period of considerable reduction in research and development spending by the pharmaceutical industry (21% between 2000 and 2009) [18].

Future developments are expected in molecular pathology and personalised care, particularly in lung cancer. In the field of lung defences and infections, future advancements are needed to define the respiratory microbiome in health and disease. Areas for future focus will be to develop mechanisms of boosting host defence and innate immunity so antivirals and antibacterials will be required less. Concerning chronic lung diseases and the ageing population, many of the comorbidities, such as cardiovascular disease, may share similar ageing pathways and future studies should investigate this. Most importantly, we need to increase patient involvement in the future as an equivalent partner in scientific research.

MEDICAL EDUCATION AND TRAINING

In the last chapter on “Medical education and training”, the future shifts outlined in the roadmap include increased workforce mobility, and with that the need to deliver adequate and consistent training to ensure respiratory healthcare workers are fully competent, wherever they work. Due to increasing

FIGURE 3. Fraction of the Seventh Framework Programme for Research and Technological Development (FP7) budget devoted to respiratory disease in general, and asthma and chronic obstructive pulmonary disease (COPD) in particular. Courtesy of G. Gayan-Ramirez (University of Leuven, Leuven, Belgium) [4].

numbers of patients with chronic conditions and the high healthcare costs generated, it is expected that there will be a move from hospital-based care to long-term homecare, resulting in a greater need for “hands-on” staff, carers and expert patients. Nurse-led care is expected to gain weight in the next decade, thus leading to an increased role for respiratory specialist nurses.

In view of these changes, it will be essential that doctors of the future have the skills to: keep up to date in their field, analyse new developments critically, practice on the basis of the best evidence available, and be able to explain and justify their advice to patients. There will be a need for leading European respiratory physicians and medical educators to collaborate and agree on defining clear standards and guidelines to ensure optimal and equal patient care. Patients want to be, and should be, involved in decision-making processes that impact their healthcare; they need to be educated in order to do this.

In view of harmonising postgraduate specialist education and to raise the quality of training (and trainers), it is desirable to introduce European training centres that are accredited according to the HERMES (Harmonised Education in Respiratory Medicine for European Specialists) criteria [19] and to persuade the national authorities to recognise European accreditation, which holds out the hope of harmonisation of training standards in Europe and would act as a stimulus to those countries with lower standards to improve their performance.

Furthermore, it will be necessary to educate dedicated young scientists in both clinical pulmonology and respiratory disease-related research, including basic/clinical respiratory pharmacology and physiology, and molecular genetic approaches to foster the training of respiratory scientists who are able to work from bedside to bench and bring back possible solutions from the bench to the bedside.

CALLS TO ACTION

The ERS now challenges all of you to engage in the future of lung health: to work together to discuss, action and fight for the priorities presented in the first roadmap for respiratory medicine. Together we can complete the road to a better future.

STATEMENT OF INTEREST

Statements of interest for M. Decramer and G.F. Joos can be found at www.ersjournals.com/site/misc/statements.xhtml

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