

Fixing lung health in the UK: accelerating respiratory research and innovation

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INTRODUCTION

Lung conditions are the third biggest killer in the UK¹ and poor lung health costs the UK £188 billion every year.² Involvement in clinical translational research improves clinical outcomes.^{3,4} However, while respiratory health was identified as a government priority in the Life Science Vision missions in 2021,⁵ it has not yet received any additional funding. Given the acknowledged respiratory research strength of the UK, it's therefore surprising that only 2.5%⁶ of public investment is spent on researching lung conditions that would help diagnose, treat and manage them much more effectively.

In 2022, we identified the need for a cross-sector group to oversee and drive forward respiratory research in the UK.⁷ Since then, Asthma + Lung UK has convened a group of experts from patient advocacy groups, charities, specialist organisations and academia (the Lung Research and Innovation Group (LRIG)), to catalyse a more collaborative approach. LRIG's new report, 'Fixing Lung Health: 10 priorities to accelerate respiratory research and innovation',⁸ highlights key areas in which progress could both transform clinical care and help return people with these conditions to school, work or a better quality of retirement (figure 1). Here we highlight some of these recommendations as exemplars of the change that could potentially happen with greater coordination of, and investment in, lung health research.

PROMOTING EARLIER INTERVENTIONS: 'HEALTHY LUNGS FOR LIFE'

There is a building body of evidence indicating that many lung conditions are preventable and therefore need to be detected and treated early, before lung damage becomes inevitable and irreversible. Prematurity and childhood lung infections are known risk factors for developing respiratory

problems.^{9,10} The increasingly accurate detection of, and specific treatments for, genetic conditions such as cystic fibrosis¹¹ and knowledge that lung function is one of the strongest predictors of mortality¹²⁻¹⁴ emphasises the need for research focused on the impact of early life on lung pathophysiology. Prevention may increasingly lead to cure.

DEVELOPING BETTER TECHNOLOGY FOR DIAGNOSING AND MONITORING LUNG CONDITIONS

To identify lung disease at an earlier stage, sensitive and specific cost-effective diagnostics are clearly crucial, but are in short supply. Recently, Asthma+Lung UK, in collaboration with LifeArc,¹⁵ has identified a number of priorities for diagnostic development including lung health indicators, low-cost primary care diagnostics, stratification tools for people with lung conditions and disease monitoring tools. An obvious target is a national screening programme for lung health in young people, but this requires further research into the component tests that would be applied. These need to be easy to perform and interpret, more sensitive



Figure 1 Lung Research and Innovation Group's 10 priorities for respiratory research and innovation.

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than spirometry and would need to be adopted at scale, in primary care or other community settings, to identify individuals who require early intervention to prevent disease progression.

DEVELOPING NEW TREATMENTS FOR LUNG CONDITIONS

While preventative strategies will help reduce the burden of lung disease, a pipeline of new treatments is urgently needed. The development of biologics for severe asthma and modulators for cystic fibrosis exemplify both the value of translation from strong basic science and the possibility to intervene even in established disease. Better coordination of the components that are required to catalyse this development is needed, including collaborative working between academia (scientists and clinicians) and industry supported by core infrastructure. The latter includes patient datasets such as those in UK Biobank and those that will come from Our Future Health and the NIHR Respiratory Translational Respiratory Collaborative (TRC), which catalyses early phase trials.

Positive outcomes from models like the Cystic Fibrosis Clinical Trials Accelerator Platform¹⁶ suggest that similar approaches could be beneficial across a wider spectrum of respiratory trials. Implementing learnings from the new clinical trial accelerator networks recommended in the O'Shaughnessy report,¹⁷ such as encouraging trial centres to collaborate and increase capacity and capability through embedding training, could further enhance trial efficiency and inclusivity. Finally, the implementation of novel trial designs and the use of remote monitoring technology should make studies more efficient and increase recruitment rates, with a more diverse and geographically inclusive participant representation.

CONCLUSIONS

Clearly, we need to do better for the 12 million people who will develop a respiratory illness in their lifetime.¹⁸ The focus should be on prevention, improving diagnostics and developing new treatments to radically reduce morbidity and mortality from respiratory diseases over the next decade. The additional knock-on effects of better school and work attendance will bring both economic benefit and likely improved mental health well-being. For those past work age, prevention, improved diagnostics and new treatments will provide a better quality of life, a reduced burden on the NHS and the opportunity for continued input into their community and other activities.

The components for such a programme are largely in place, but two are missing. First, national coordination remains an

issue, which could be directed through LRIG and potentially additional novel structures. Second, there is still a need for financial investment to drive forward research proportionate to the disease burden; this requires a tripling of current public funding for respiratory research. One opportunity, highlighted by LRIG, is to develop and agree some national 'grand challenges' that could provide a focus for effort and investment, contributing towards this national approach.

Finally, the measures outlined in the 'Fixing Lung Health' report are likely to provide an economic return on any investment. Previous analyses by Asthma+Lung UK suggest that investing £721 million of funding between 2023 and 2030 could contribute an additional £851 million to the economy over the same time period.² The LRIG recommendations are likely to promote the UK as a lung research superpower, bringing with it health, better quality of life and economic benefit.

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