EBioMedicine 2 (2015) 1025–1026

Contents lists available at ScienceDirect

EBioMedicine

journal homepage: www.ebiomedicine.com

Commentary

Who is Funding What in the Fight Against Pneumonia?

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Lower respiratory tract infections (LRTIs), including pneumonia, are a leading cause of mortality globally. In 2013, an estimated 708,600 children aged 1 to 5 years of age died from LRTIs making it the main killer in this age group; approximately 99% of these deaths occurred in developing countries. (Nair et al., 2013; GBD 2013 Mortality and Causes of Death Collaborators, 2015).

In developed countries, the burden of pneumonia falls more heavily on older persons with annual incidence rates of pneumonia-related hospitalisations of over 60 per 10,000 for adults aged 65 to 79 years, increasing to over 160 per 10,000 for adults aged 80 years and older (Jain et al., 2015). Over the next decade, further changes in the population age structure globally anticipate increases in susceptible persons.

Given such large health implications, commensurate investments in basic and translational research to tackle this problem are warranted. In this Journal, Head and colleagues report on funding awarded to UK institutions for pneumonia research from 1997 to 2013 (Head et al., 2015). Their report updates results arising from the Research Investments in Global Health study which previously described data up to 2010 (Head et al., 2014).

The proportion of funding for pneumonia in relation to all respiratory infectious research was 6.8% (£27.8 million) over the period 1997–2010 and increased to 19.9% (£28.8 million) over the period 2011–2013. The areas of greatest relative increase were in Global Health (16.6%; £4.6 million to 60.45%; £17.4 million) and Diagnostics (1.2%; £0.3 million to 23.6%; £6.8 million). These increases are welcomed and are consistent with the efforts of the World Health Organisation and funding bodies, such as The Bill & Melinda Gates Foundation, to address the problem of childhood pneumonia in resource-poor settings (Adegbola, 2012).

In contrast, a decrease in funding for Antimicrobial Resistance from 10.4% (£2.9 million) over the period 1997–2010 to 0.01% (£0.004 million) over the period 2011–2013 was noted. This is an unexpected finding in the context of the high priority set by the UK Chief Medical Officer, Sally Davies, in relation to the problem of antimicrobial resistance (Davies et al., 2013). Many of the so-called "ESKAPE" pathogens (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacter species*) that demonstrate multi-drug resistance are respiratory pathogens associated with hospital-acquired pneumonia (Boucher et al., 2009). Further investigation may yield explanations for this apparent reversal in pneumonia research investment related to antimicrobial resistance.

In addition to quantifying and categorizing funding awards, Head and colleagues have tried to map research investment to research output using bibliometrics, specifically the total number of publications related to pneumonia across the study period. Understandably, an absolute count of publications does not adequately reflect research quality. Elaborate methods for the evaluation of research quality, akin to the UK national Research Excellence Framework (REF), are currently available. However, even these sophisticated approaches have their own deficiencies (Wooding et al., 2015). More consistent and internationally validated methods are awaited. The impact of research funding on advances in clinical practice is potentially even more difficult to measure. For instance, the absence of major differences between 2009 and 2014 in British national guideline recommendations for the management of adult community-acquired pneumonia hints at a lack of substantive advances in the related evidence base over that period (Lim et al., 2015). Is this due simply to a deficiency in relevant research investment? It can, of course, take many years for pre-clinical research to bear fruit at the bedside. In this respect, the relative increase in translational pneumonia research observed by Head and colleagues in 2011–2013 compared to earlier years hopefully presages concrete advances in clinical management in the near future.

In the meantime, the increase in pneumonia research funding between 2011 and 2013 compared to 1997 and 2010 is not a reason for complacency. Relative to the burden of disease, funding for pneumonia research is still at a lower level compared to funding for tuberculosis and influenza. In 1898, in the 3rd edition of The Principles and Practice of Medicine, Sir William Osler wrote of lobar pneumonia that it "*is the most fatal of all acute diseases….. So fatal is it in this country, at least, that one may say that to die of pneumonia is the natural end of old people*". Sir Osler was writing at a time when doctors and patients did not have the benefit of antimicrobial agents nor vaccines. His words should not be taken to engender a sense of nihilism in relation to the modern management and investigation of pneumonia. The work by Head and colleagues is valuable not simply for its description of funding already awarded, but lends direction to funders and researchers in the pursuit of further research that will contribute towards the control of this dreaded illness in persons of all ages.

Declaration of Interest

The author's department has received funding from the National Institute for Health Research (ref 11/46/14) for a pandemic influenza

DOI of original article: http://dx.doi.org/10.1016/j.ebiom.2015.06.024.
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http://dx.doi.org/10.1016/j.ebiom.2015.08.028

clinical trial and unrestricted investigator-initiated research funding from Pfizer (ref WI179623) for a study on pneumonia.

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