

# NIHR 'Health Futures' survey

July 2017

The British Society of Immunology is the largest immunology society in Europe. Our mission is to promote excellence in immunological research, scholarship and clinical practice in order to improve human and animal health. We represent the interests of more than 3,000 immunologists working in academia, clinical medicine, and industry. We have strong international links and collaborate with our European, American and Asian partner societies in order to achieve our aims.

***Differences between present and future health issues – in relation to your area of interest, what differences do you foresee in the state of health and provision of healthcare in England in 20-30 years' time? Are these changes likely to affect different socioeconomic, ethnic or geographic groups differently?***

In addition to its traditional anti-infective and anti-cancer roles, the immune system is implicated in a broad set of conditions, including metabolic and cardiovascular diseases as well as dementia. Building on decades of basic research, our improved understanding of the immune system and its links with these disease areas is now uncovering promising new therapies for presently intractable conditions, such as Alzheimer's and some forms of cancer, which may become standard lines of treatment in the future.

Conditions underpinned by dysfunction of the immune system – e.g. autoimmune diseases (AD) and allergy – are growing in prevalence and clinical importance. ADs represent a broad set of conditions, the precise aetiology and pathogenesis of which is still poorly understood. They are chronic (intervention is rarely curative) and therefore exact a high toll on clinical resources and patients' health related quality of life. Their increasing prevalence, the cause of which is unknown but thought to be due to longevity and environmental factors, will have significant impacts on health needs and service provision in the coming decades.

In addition, the incidence of allergy is also growing at an alarming rate: in the 20 years to 2012 there was a 615% increase in the rate of hospital admissions for anaphylaxis in the UK. In 2010 allergic diseases cost the NHS an estimated £900m a year, mostly through prescribed treatments in primary care, representing 10% of the GP prescribing budget. This trend presents significant service provision challenges, particularly concerning workforce composition (e.g. the need for clinical immunologists) and training needs (e.g. in primary care).

Vaccination against infectious disease will continue to form an important public health tool over the next 20-

30 years. Advances in technology and the development of new vaccines against viral diseases (e.g. flu, RSV), bacterial conditions (e.g. chlamydia), and parasites (e.g. malaria) could have significant impacts on public health in the UK and abroad. Novel vaccines are also an important strategy in mitigating the threat of AMR. In the UK and other developed countries challenges with public attitudes remain a small but not insignificant risk to ensuring comprehensive vaccination coverage. For those of lower socio-economic access, access to immunisation services can also be a problem.

***Key drivers – what do you think are the key drivers of the changes you have described?***

Changing demography – a growing and ageing population. Age associated decline in immune function – immunosenescence – plays a critical role in the development and progression of disease in later life. Understanding immunosenescence is also essential for the effective delivery of healthcare interventions, particularly vaccination.

Lifestyle factors – lifestyle factors such as alcohol, tobacco, and poor diet and lack of exercise are major risk factors for conditions such as cardiovascular disease, COPD, cancer, and dementia, where immune processes are implicated either as a cause or consequence of disease. Present trends indicate that these behaviours will continue to drive increased incidence of such conditions, particularly in disadvantaged groups.

Environmental factors – exposure to a range of environmental agents is thought to influence prevalence of several immune conditions, including allergic and autoimmune diseases. These include gaseous and particulate constituents of air pollution, which is a serious and growing problem in urban areas. In combination with diet and other factors, environmental exposures are also thought to influence composition of the gut microbiota, with direct consequences for immune function. Similarly, environmental exposures can influence gene expression, with these epigenetic changes inherited by subsequent

# NIHR 'Health Futures' survey

July 2017

generations.

Climate change – influences the size and distribution of disease vectors, such as mosquitos and ticks, with consequent impacts on emerging and re-emerging zoonotic diseases, including those not yet established in the UK (e.g. West Nile Virus or dengue fever). Importantly, international travel is also a factor, with globalised networks of transport facilitating communicable disease spread.

***Future healthcare trends – in your opinion what will be the major trends in health and healthcare in England over the next 20-30 years? (Extending beyond your immediate area of expertise)***

In addition to the above the following trends will shape health and healthcare in the coming decades:

Medical advances – translation of basic science into breakthrough innovations that can transform areas of healthcare. In addition, the promise of personalised therapies delivering improved outcomes for patients (driven in part by decreasing cost of whole genome sequencing). Within the context of the NHS however, rate of adoption of new medical innovation is likely to be dictated by fiscal constraints.

Technology - technology will change how patients interact with the health service, democratising care so they can access health records and other information through apps or online. The relationship between the patient and the care giver will change, with the increased availability of reliable information facilitating self-diagnosis and management. Online consultations and prescribing are also likely to be future trends.

Economic pressures – on current trends NHS spending per head of population will continue to decline. The economic impacts of Brexit and other world events are unknown while financial austerity looks set to continue directing public spending, with impacts on health and research budgets.

Public attitudes – increasing public expectations regarding quality and access to healthcare will increasingly confront pressures in demand and resourcing. This is true across the spectrum of NHS services – acute, primary ambulatory, community, mental health, and specialist – as well as social care. Public attitudes on vaccination remain generally positive, but a small and committed

antivaccine element persists.

***Underrepresented health and healthcare issues – are there any issues that are underrepresented in the debates around the future of health and healthcare in England? If so, what are they and why do they require greater attention?***

Pandemic infection – we remain vulnerable, as a country and an international community – to outbreaks of emerging and re-emerging infectious disease of pandemic potential. The MRC has led commendable work to improve national resilience, linking NHS, academia, and industry through its Vaccine Network initiative. However, there is still considerable scope to strengthen research efforts in the development of new vaccines, drugs, and diagnostics against pathogens where these interventions do not currently exist. This will require global leadership with coordinated and collaborative action across the public and private sectors.

Chronic Hep B – the introduction of a hexavalent vaccine that protects against Hep B to the UK routine schedule later this year is welcome. Nevertheless, chronic Hep B remains a major global health concern with around 257 million people living with the disease globally, 20-30% of whom will develop cirrhosis or hepatocellular carcinoma. An estimated 650,000 are thought to die each year from these complications because of chronic Hep B infection. In the UK prevalence is low with around one in 350 of the population thought to be infected. Many of these individuals contract the virus abroad, highlighting the need to enhance international efforts to tackle this disease. Unfortunately, Hep B is currently not seen as a public health priority and receives only a fraction of the publicity, funding, and awareness of conditions of comparable disease burden, for example malaria and TB.