Impact Outlook

- 'Although huge strides have been made in the prevention and treatment of cardiovascular disease (CVD) in the last 30 years, especially compared to other areas of medicine, the work is hardly done'

- 'An area that excites me is the concept of personalised medicine. Would it not be great if we could more precisely identify the individuals who would benefit most so that we can target our treatments more efficiently? With advances in genetics and identifying other biomarkers we may be able to do this'

Raising awareness to win the fight

*For **Professor Sir Nilesh Samani**, Medical Director of the **British Heart Foundation (BHF)** these are exciting times. Whilst considerable work remains in the battle against cardiovascular disease (CVD), here he expands on the important developments in regenerative medicine and the success of the BHF in raising awareness of CVD*

Could you begin by explaining the background behind the British Heart Foundation (BHF)?

The BHF was founded in 1961 by doctors concerned about the growing epidemic of heart disease and committed to finding new ways of tackling it through research. At the time, cardiovascular disease (CVD), was responsible for half of all deaths in the UK and very little was known about its causes or how to treat it.

Since then, the public's support has enabled the BHF to fund thousands of vital projects investigating all aspects of CVD, leading to breakthroughs that have saved and improved lives worldwide. The BHF's vision remains to end the death and suffering caused by premature CVD.

Please explain the BHF's Research Strategy 2015-2020?

In our five-year research strategy we've committed to maintaining our approach as a response mode funder, supporting high-quality research into all CVDs at every stage of the scientific process.

We also set out new areas of focus that we hope will speed up the translation of our research, enhance collaboration and will bring patients closer to the decisions we make. In particular we have:

- Launched a translation grant designed to support early phase development of potential new drugs, diagnostics and devices to help them attract further development by industry.

- Created a Clinical Studies Committee, which will allow us to fund more clinical research and trials, including those that do not have the commercial incentive to attract industry support, but could lead to significant benefits for patients.

- Launched a Patient Advisory Group, which will meet twice a year to provide feedback on all applications to the Clinical Studies Committee in terms of the importance of the research and the applicant's commitment to patient and public involvement.

Could you talk a little about the collaborative nature of BHF and any issues that have arisen and how you have overcome these?

We specifically created our BHF Research Centres of Excellence to bring together biomedical scientists, physicists, chemists, engineers and mathematicians to accelerate progress in answering the most challenging cardiovascular questions. We believe that such inter-disciplinary research is essential to making transformative advances.

Funding partnerships with organisations such as the Medical Research Council and the Wellcome Trust also allow us to be part of ambitious research projects that are transforming our understanding of heart disease. For example, we now part fund UK Biobank – an initiative that has recruited 500,000 people aged between 40-69 years from across the UK, and holds a vast amount of data on their health, including the biological factors that can increase the risk of heart disease. This scale of project simply wouldn't be possible without collaborations between research funders.

Finally, we recognise the value of international collaboration in research and BHF-funded researchers are engaged extensively in such collaborations. In 2016, our researchers reported 385 instances of collaborations in Europe and 221 collaborations in the US. Forty-eight per cent of all research papers acknowledging BHF funding (published 2010-2014) had international co-authors, across 95 different countries. This is testament to the fact that BHF research not only benefits people in the UK, but worldwide.

We now want to build on this collaborative approach and are in discussions with research funders in other countries to promote joint funding of research to create more impactful science to get added value from every pound we spend.

Brexit poses a potential challenge, not only to BHF-funded research collaborations, but to science generally, and we are working with other funders and government to mitigate the effects.

Professor Sir Nilesh Samani undertook his undergraduate medical training at the Leicester Medical School, UK. After qualifying, he did a mixture of clinical and academic training and was appointed as a senior lecturer in cardiology at the University of Leicester and consultant cardiologist at the regional Cardiac Centre in Glenfield Hospital, Leicester, UK in 1993. He was promoted to a Chair in Cardiology in 1997.

He has had a long association with the BHF having received his first research grant from them in 1991. He was awarded a BHF Professorship in 2003. He was appointed as the BHF's sixth Medical Director in September 2016 and continues some clinical practice and research at the University of Leicester.

What are the key challenges and where do you see the next advances coming in cardiovascular research?

Although we've made huge strides in the prevention and treatment of CVD in the last 30 years, the work is hardly done. For many CVDs, our understanding of the disease process and therefore the development of effective treatments can only be described as quite primitive.

For example, atrial fibrillation (AF) is a common heart rhythm disturbance, particularly in older patients, which can impede the function of the heart and is a major risk factor for stroke. More than a million people have been diagnosed with AF in the UK and its prevalence is only going to rise as the population gets older.

At the moment we can reduce the risk of stroke from AF by putting patients on blood-thinners, such as warfarin (at the risk of increased bleeding) and in some patients create scars in the heart by radiofrequency ablation to prevent AF being triggered. But these are rather blunt treatments and we need to better understand the mechanisms that cause AF.

It's estimated that more than 600,000 people in the UK have a faulty gene that can cause an inherited condition such as hypertrophic cardiomyopathy. While we are making great progress in identifying the genes that cause these conditions, the real test of success will be when we do something to mitigate the effect of the faulty gene.

In terms of areas where I see advances happening, I am excited by the potential of regenerative medicine. Only a few years ago, the dogma was that heart muscle cells in adults did not divide and the damaged heart was not repairable. Both of these have been shown to be wrong and rapid strides are being made in trying to harness the potential of stem cells in repairing the heart. The BHF is investing heavily in this research through our Regenerative Medicine Centres and I am optimistic that during my tenure as Medical Director, this research will move closer to the patient.

The other area that excites me is the concept of personalised medicine. At the moment, we treat a large number of patients with drugs such as statins to prevent cardiovascular events in a few at the expense of some others not benefiting, but experiencing side effects. Would it not be great if we could identify the individuals who would benefit most so that we can target our treatments more efficiently? With advances in genetics and identifying other biomarkers we may be able to do this.

What steps have you taken to promote awareness of both the work of the BHF, but also issues surrounding CVD?

At the BHF, we are completely reliant on the donations of our supporters to fund our research. This means that raising awareness of the scale of heart disease and the impact of our research is vital in giving people the confidence to support us.

A recent challenge we've faced is that many people have come to perceive heart disease as a preventable lifestyle disease, making them more willing to support charities in other areas such as cancer and dementia. As part of our new strategy we've tried to raise awareness of how conditions such as a sudden cardiac arrest or heart attack can devastate families often without warning, and do more to publicise conditions such as cardiomyopathies and congenital heart defects that affect people indiscriminately.

In the past, we've also been at the forefront of behaviour change advertising that has helped save lives. This includes the memorable advert in which former footballer Vinnie Jones teaches the nation CPR and our 'Smoking Kills' ad depicting a man smoking a coronary artery.

We focus a lot of attention on explaining our mission to the public and the importance of CVD, because without their support, we wouldn't be able to make many of the breakthroughs that are today saving and improving people's lives.

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