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Foreword

In the next few years the UK could establish itself more firmly as a leader in health and life sciences or it could begin to lose that status forever.

The UK is a global power in health. It has world class universities and research, is a global leader in health policy and international development, has strong life sciences industries, a vibrant and diverse not-for-profit sector and exercises profound influence on health services globally. However, a combination of external competition, internal policy, reduced R&D spend and poor coordination could damage all of these assets – particularly if the UK fails to respond to changing power and perspectives across the world.

We argue here that the UK should aim to strengthen its position as a global leader in health working in partnership with others to improve health globally. This will require new strategies for creating mutually beneficial partnerships globally and greater alignment internally between the four sectors of academia, commerce, government and the not-for-profit sector; as well as the integration of health into foreign policy. This approach will bring great benefits to the UK and to the world.

This report has two elements. The larger part is a mapping of the UK's footprint on health globally undertaken by Nadeem Hasan, Sarah Curran, Arnoupe Jhass, Shoba Poduval and Helena Legido-Quigley from the London School of Hygiene & Tropical Medicine. This is accompanied by commentary and recommendations agreed between ourselves and the researchers.

We thank the researchers for their excellent work and are also very grateful to the many leading figures in health nationally and globally who have provided support and advice for this work.



Meg Hillier
Chair



Lord Crisp
Co-Chair



Lord Kakkar
Treasurer

All-Party Parliamentary Group on Global Health

Summary

This report shows that the UK plays a leading role in health globally – in research and education, public health, healthcare, life sciences, policy making, international development, philanthropy and the NGO sector. Its global contribution is second only to the US, which it surpasses in some areas.

This strength is a remarkable asset at a time when health is becoming ever more important globally: politically, economically, demographically and environmentally. It is one of the fastest growing sectors of the world economy and will get a further boost later in the year when the nations of the world sign up to the goal of universal health coverage as part of the Post-2015 Development Agenda.⁽¹⁾

There is an enormous opportunity here for the UK to help further improve health globally whilst at the same time enhancing its own standing in the world and strengthening its economy. There are challenges to be met, new partnerships to be made and competition from elsewhere; but by creating better alignment and linkages between the different sectors within the UK and judicious policy making and investment the UK could bring great benefits to the country and the world.

Benefits for the world from leading the way on improving health worldwide through:

- Developing global public goods in health – generating the research and knowledge that will help improve health, tackle global epidemics and the new challenge of non-communicable diseases
- Supporting other countries to strengthen their health systems and achieve universal health coverage – sharing the UK's expertise in health systems governance and delivery and in health worker education and training; whilst at the same time learning alongside other countries how to improve and develop on current practice
- Advocating for the right to health and supporting civil society globally – using all its formal and informal, governmental and non-governmental networks, links and channels

Benefits for the UK from strengthening its influence globally and developing its institutions, industry and economy through:

- Helping the UK strengthen its influence and soft power as the best networked country in the world with strong relationships, global connections and influence in all parts of the world – based on a clear set of humanitarian principles, values and goals
- Promoting the UK's healthcare and life sciences industries – and helping develop a workforce and economy based on innovation, creativity and high level scientific skills and knowledge
- Developing the UK's position as a global 'health hub' – where there is major expertise in every area of health – through building on the strengths of individual institutions and industries, creating greater synergies between sectors, promoting investment, and attracting and retaining the best talent

The rapidly changing environment

There is a unique alignment globally of public demand for health care, investment, innovation and scientific discovery as well as global health security concerns.

Citizens in countries from China and India to Saudi Arabia, Latin America and Africa are demanding that their Governments act to improve health care and those individuals that can afford it are buying their own. Governments are responding with large increases in health spending and venture capitalists seeking health investments are driving asset prices sky high. Growth in health spending globally is expected to rise by 5.2% annually, with Asia and Australasia expected to see growth of 8.1% a year.⁽²⁾ Meanwhile the World Health Organisation, the World Bank and other leading institutions are encouraging countries to develop universal health coverage for their citizens with the likelihood that it will be a central part of the Post-2015 Development Agenda.

There are major advances in the biological sciences and biotechnology and in the understanding of the behavioural sciences and the social determinants of health. At the same time fast developing countries are generating new ideas about health and introducing innovations in health services and systems. There are, however, also new health threats posed by new and resurgent diseases and by bio-terrorism and other global health security concerns.

This confluence of citizens' demands, investment, science, technology, innovation and security issues is creating a situation where expertise in health and health systems will be invaluable. Existing shortages of health professionals will be exacerbated – placing enormous extra demand on education and training. This represents a huge opportunity for organisations and countries, like the UK, which have the necessary skills and resources to respond – provided they do so in way that supports local ideas and approaches and doesn't simply replicate existing (mainly European and American) models of health care, staffing and education.

The opportunity

Universal health coverage – creating demand for knowledge and expertise

Growing investment from private and public sources – 5.2% per year globally, 8.1% in Asia and Australasia

Major advances in biosciences, biotechnology and behavioural sciences – driving improvement

Demand for health workers – requiring massive scale-up of education and training

Growing threats from disease and security concerns – requiring expertise and cooperation

The UK's current strengths and future challenges

The UK has great strengths but some critical challenges. This report describes some aspects of the UK's leading role across its different sectors. It has strong partnerships in all sectors and its research is multi-disciplinary and very broadly based. It has very strong linkages globally through the NHS – which has helped shape many national health systems; through its universities, scientific journals and Royal Colleges which conduct research and provide education and accreditation; and through its leading role in international development with DFID; foundations and the network of British NGOs. External observers note a culture of creativity, high standards of research, patient centeredness and probity.

Competition comes from traditional sources such as the USA – which is strengthening its own global health research capacity and has a highly active, health focussed philanthropic sector – and from fast developing countries like South Korea where health is a major domestic and international priority. As serious, however, are internal weaknesses: its main relationships are with a limited number of nations in a restricted geography, there is a lack of technical skill in delivering alternative models of health financing, the NHS is facing an uncertain future, more emphasis is needed on health promotion and the prevention of disease, most commercial financing is short-term and current immigration policies are discouraging foreign students and researchers.

Strengths	Challenges and risks
Partnerships, collaboration, networks	Changing world power
Education, research and development	Human resources and commercial funding
The NHS, health systems and influence globally	Uncertainties, alternative models
Commitment to international development	Focus on only a few countries with large regional gaps
Culture, creativity, standards and probity	Competition

Vision, goals and strategies

The UK can build on its strengths as an outward and forward looking country, creative, open to new ideas and with great traditions of science, health and education. The report proposes a new vision supported by two goals and four strategies for doing so:

Vision

For the UK to be recognised as a global leader in health using the combined strengths of its academic, government, commercial and not-for-profit sectors to work in partnership with others to improve health globally.

Goals

1. **To lead the way on improving health worldwide through:**
 - Developing global public goods in health – this builds on the research and education capability and expertise and its partnerships with others in international organisations.
 - Supporting other countries to strengthen their health systems and achieve universal health coverage – this builds on the work of DFID, NGOs, Healthcare UK; NHS partnership schemes; the global networks of NICE, the Royal Colleges and other health bodies; and the role of universities in educating and training health workers.
 - Advocating for the right to health and supporting civil society globally – this builds on the Government's role internationally as well as on the work of UK NGOs.
2. **To strengthen the UK's influence globally and develop its institutions, industry and economy through:**
 - Helping the UK strengthen its influence and soft power as the best networked country in the world – this builds on the many powerful historical links around the world (including the Commonwealth, Europe and the G7); its role in the World Health Organisation and other international bodies and needs to extend further into the fast developing areas of the world.
 - Promoting the UK's healthcare and life sciences industries – this builds on the current successful approaches including the Strategy for UK Life Sciences; Healthcare UK; The Academic Health Science Networks, 'Cell Therapy Catapult' and other collaborative initiatives and new ventures including Med-City and the Northern Health Science Alliance.
 - Developing the UK's position as a global 'health hub' – this builds on the many strengths across all the sectors identified in this report.

Strategies:

1. **Create much greater alignment and synergy between the different sectors concerned with health**
 - This already happens through some of the ways identified above but real barriers remain.
2. **Work on health globally in a spirit of mutual learning and co-development**
 - This recognises both the shifting of power and perspectives in the world and the need for the UK, for all its strengths, to improve and adapt its own services and learn from others.
3. **Create a programme of support for universal health coverage which can be offered to other countries**
 - This builds on existing development policies but makes full use of the enormous expertise in health systems and the education and training of health workers.
4. **Adapt the Government's foreign, domestic and economic policy to support these goals**
 - This recognises that health needs to be part of foreign and domestic as well as economic and development policy – and seen as contributing to the UK acting “as a serious force for good as the world continues to change”.⁽³⁾

Recommendations

These recommendations are designed both for Government and for leaders in every sector concerned with health. We recommend that:

1. The Government creates and adopts a new vision and strategic approach to health – building on the existing ‘Health is Global’ strategy and other policies and which incorporates the goals and strategies identified here.
2. The Government, commercial enterprises and the whole health sector actively work together to develop the UK as a global ‘health hub’ – where there is major expertise in every area of health – and develop their links and networks throughout the globe, not only in the UK’s traditional areas of influence, so as to establish the UK as a respected global source of health expertise.
3. The Government as well as research institutes and foundations continue their support for the development of capacity and capability in science, research and health in other countries and, in recognition of changing world power and perspectives, link this with overt and clear support for mutual learning and co-development.
4. The Government, Departments of Health, International Development, Business, Innovation & Skills and Education work with universities, the NHS, commercial enterprises, NGOs and other health bodies to determine how best to support health system strengthening, universal health coverage and health worker education and training globally.

5. The NHS, both directly and through Health Education England and the equivalents in the other UK countries, actively supports international volunteering and the education and training of UK healthcare and development workers abroad.
6. Government, academia, foundations, the commercial sector and the NHS continue to support the current Strategy for UK Life Sciences, widen its scope and develop its links with Healthcare UK.
7. The Research Councils and other funding bodies continue to develop the way they work together and establish some Grand Challenges to promote the UK's role in health and related disciplines in a changing world.
8. The NHS, local authorities and their partners recognise the major role they have in influencing health policy and developments around the world, continue to improve health and care services and develop new and much stronger ways to promote health, prevent disease and develop a health creating society.
9. UK NGOs concerned with health and its wider determinants work together to support long-term international partnerships, develop civil society and the capability to run services, and advocate for health and access to health care globally.
10. The Government reviews immigration policy so as to enable universities, research institutes and other science and health based organisations to recruit talent globally and provide education and training services effectively in health.

Mapping the UK's contribution to improving health globally

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Introduction

The All-Party Parliamentary Group on Global Health commissioned researchers from the London School of Hygiene & Tropical Medicine to map the UK's contribution to health globally. Whilst the UK's strengths in different sectors of health are well known, this is the first attempt to map out the full range of activities across the state, academic, commercial and not-for-profit sectors. This report therefore presents a first picture of:

- A mapping of UK actors in each sector and their contribution to improving health globally
- A discussion of how this also benefits the UK and its standing in the world
- The strengths and opportunities for increasing this contribution and conversely, the UK's weaknesses and vulnerabilities in this area and the threats it faces to its current position

The report uses a broad definition of health to include all those activities which have improving health or the provision of health care as their primary objective. It does not include the many factors and activities that affect the social and wider determinants of health. Thus the development of vaccines and health information systems are included but not the strengthening of primary and secondary education, which in some cases may have an even bigger impact on health.

The report recognises that the UK's activity in health covers a wide spectrum, from the domestic delivery of health services to global leadership on issues such as responding to disease epidemics and antimicrobial resistance. It is ultimately impossible to draw sharp distinctions between these because even activities directed at improving health within the UK can have a global impact, for example countries copying aspects of the NHS and utilising NICE guidelines. This report attempts to capture the full range of these activities, with a focus on those with greatest global impact.

The research for the report was undertaken through a mixture of literature reviews, analysis of primary data and semi-structured interviews with leaders both from the UK and abroad. Findings have been discussed at different stages with people from each of the four sectors as well as with Parliamentarians and representatives of Government. The final conclusions and recommendations were then drawn up and agreed between the researchers and the officers of the All-Party Parliamentary Group on Global Health.

The report begins with four case studies where the UK has played a major role which cut across these different sectors. They show how the combined effect of government leadership, high quality academic research, commercial development and the expertise of the not-for-profit sector can be a powerful force for improving health globally. The report then continues by mapping the contribution of each of the four sectors:

1. **The state sector** – the National Health Service (NHS) and supporting bodies, as well as the role of the Department of International Development (DFID) in improving health
2. **The academic sector** – bodies that fund, carry out and disseminate health research, as well as conducting teaching and training of health workers and researchers
3. **The commercial sector** – healthcare companies that support the development of health systems overseas and life sciences companies that develop pharmaceuticals, medical biotechnology and medical devices
4. **The not-for-profit sector** – international NGOs active in health, philanthropic foundations that fund health research and programming overseas, and medical research charities

These chapters start with the state sector both because it has such a large direct role to play in health – through the NHS and through its international development activities – but also because it provides the wider policy environment, and often support for, the academic, commercial and not-for-profit sectors. The strength of the academic sector leads directly to the strength of the commercial life sciences sector, and the diverse not-for-profit sector connects with the other three sectors through various different routes.

The boundaries between these sectors are not rigid, for example state bodies that support the commercial and academic sectors are mapped in their respective chapters; NGOs that support volunteering in the NHS are mapped in the state chapter; and the Wellcome Trust and medical research charities are major funders of health research but are mapped in the not-for-profit chapter and referred to in the academic chapter. This reflects both the interconnectedness between sectors and that fact that actors often fit into more than one category.

The report concludes with findings about the distinctive role that the UK plays within the wider global context and developments underway in health across the world – suggesting a new vision and strategy for the future and making recommendations both for protecting and extending the UK's current position in health globally.

This report shows that the UK makes a remarkable contribution to health globally, with a broad range of actors and institutions across all four sectors working independently and in partnership to tackle health challenges in the UK and across the world. It also shows that in addition to its strengths, the UK has weaknesses in this area, as well as facing threats to its current strong position and opportunities for growing its role in the future. This first attempt to map the UK's contribution naturally contains some gaps, and whilst answering some questions raises others. It is expected that future iterations of this study may refine the approach used here and build on the findings.

State Sector

The UK Government has shown **global leadership** in health, including



Over **25,000** health workers in Africa and Asia have received training and education through NHS volunteering



The **UK is the 2nd largest donor in the world**, and the only G7 country to meet the global target of 0.7% of GNI



DFID spends **>£900 million**

per year on health in developing countries directly, and is one of the top 2 state funders of WHO, UNICEF, GAVI, the Global Fund and the ICRC

DFID's investments have led to over **36,000 maternal lives** saved and over **64,000 neonatal lives** saved since the 2011 strategy was launched

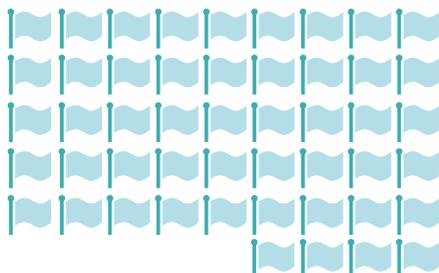
Commercial Sector

Healthcare UK has helped the UK healthcare sector generate **exports of £749m in 2014/15 up from £556m in 2013/14**, including commercial exports in areas such as:



Since 1978, the International Hospitals Group has carried out over 450 healthcare projects to strengthen

health systems in 49 countries



The UK has >4,800 health life sciences companies, generating over

£55bn per year employing over 180,000 people across the UK & exporting across the world

Europe's leading biotech sector with the largest pipeline and attracting the most investment in Europe



GSK is the **top ranked company in the world** for improving access to medicines in low-income countries

Academic Sector



3 of the top 5
universities for medicine in the world:
Oxford, Cambridge & Imperial College & the **2nd largest number** of top 100 universities globally in both medicine & life sciences



Ranks 1st
for medical research in the G7 by citation impact & over
81% of clinical research is ranked as world leading or internationally excellent

A broad funding base including **MRC, NIHR, Wellcome**, charities & life science companies spending over **£7bn per year** on supporting medical research










2 of the top 4 medical journals in the world in the **Lancet** and the **BMJ**, and **Nature** the top ranked science journal globally



Not-for-profit Sector








Over 6,500 NGOs active in improving health outside the UK, through **grant-making, service delivery, capacity building, advocacy** and **research** and **innovative approaches**



Over 136 medical research charities funding **1/3** of all publicly funded research, supported by the UK public who rank top in the G7 and **4th in the world** for charitable donations



DEC brings together **13 leading UK** NGOs to fundraise and deliver a coordinated humanitarian response to save lives in disasters, **raising over £1.1bn** over 65 appeals since 1963



A vibrant foundation sector including the **Wellcome Trust** and **CIFF**, world leaders in **giving for health**

1. Cross-sectoral case studies

Introduction

This report is structured in four main chapters, covering the state, commercial, academic and not-for-profit sectors. However there are a number of areas of health where the UK has shown cross-sectoral leadership that doesn't neatly fit into any one sector. These include areas where the UK has a longstanding history of global leadership spanning decades, as well as those where the UK's leadership is more recent.

What these case studies demonstrate is that the UK's leadership in health is a result of strength across all four sectors and collaborative working between them, as well as its strong relationships with partners in countries across the world. It is through government leadership in health; a broad range of research funders and universities carrying out world-leading research; progressive businesses; and a highly active, vocal NGO sector that the UK is able to be a major global leader in health. This leadership extends from the fight against major infectious diseases that affect the world's poor to making a leading contribution to tackling the health challenges of the future. The four case studies of genomics, malaria, neglected tropical diseases (NTDs) and antimicrobial resistance (AMR) highlighted here are only part of the picture, with further examples of the UK's leadership described throughout the report.

Genomics

Genomics is the study of genes and their functions, and the UK has played a leading role in developing this area of research and transforming it into technologies that have the potential to improve people's health. One of the most important breakthroughs in genomics was the discovery of the double helix structure of DNA by James Watson and Francis Crick at Cambridge University in 1953, leading to the Nobel Prize in Medicine or Physiology. This was followed by the sequencing of the first full DNA genome by Fred Sanger and his team at Cambridge, leading to his second Nobel Prize in Chemistry in 1980. During this process, they developed the 'Sanger method' for sequencing DNA that would go on to be used to sequence the entire human genome.⁽⁴⁾

The Human Genome Project (HGP) was launched in the USA in 1990, joining with international collaborators to achieve the goal of sequencing 95% of the DNA in human cells in 15 years. In 1993, with funding from the Wellcome Trust and the Medical Research Council (MRC), the Sanger Centre was opened as the British arm of the HGP. The Sanger Centre, now the Wellcome Trust Sanger Institute, has made an enormous contribution to the HGP and progress in genomics. This extends from the collaboration with the Genome Sequencing Centre at St Louis to complete the first genomic sequence of a complex organism – the nematode worm *C. elegans* – to being the largest contributor to the HGP, contributing nearly one-third of the work to the publication of the human genome in 2003. The Sanger Institute is also part of the 1000 Genomes Project, an international collaboration to produce an extensive public catalogue of human genetic variation to support medical research, and the International Cancer Genome Consortium (ICGC), looking at genomic changes in 50 different cancers to support research into new methods of prevention and treatment.⁽⁵⁾

There are a broad range of other UK institutions that are making major contributions to genomics research. These include the Wellcome Trust Centre for Human Genetics (WTCHG) at the University of Oxford; the MRC Centre for Neuropsychiatric Genetics and Genomics at Cardiff University; the Medical Genomics unit at the UCL Cancer Institute; the Manchester Centre for Genomic Medicine and the Centre for Integrated Genomic Medical Research (CIGMR) at the

University of Manchester and a number of others. Research funding has come from the MRC, the National Institute of Health Research (NIHR), the Wellcome Trust, medical research charities such as Cancer Research UK and other sources.

In addition to these significant contributions to genomic science, the UK is now set to be a leader in using these breakthroughs to improve people's lives. The Department of Health (DH) launched Genomics England in 2013 to take forward the UK's leadership in this field. Its major purpose is to conduct the 100,000 Genomes Project which aims to sequence 100,000 genomes from NHS patients by 2017, starting with rare diseases, cancer and infections. To carry this out, a first wave of 11 Genomic Medicine Centres have been set up across the country, from Oxford, Cambridge and London to Birmingham, Manchester and Newcastle. Health Education England (HEE) are taking the lead on ensuring that scientists, geneticists and doctors are being trained to interpret the data and what it means for patients. As well as sequencing the genomes of some patients with infections, Public Health England will be delivering whole genome sequencing of pathogens, starting with TB. The Genomics England Clinical Interpretation Partnership (GeCIP) brings together funders, researchers, trainees and clinicians to collaborate to maximise the benefits of the programme, and the GENE Consortium brings together pharmaceutical, biotech and diagnostic companies to collaborate to develop new medicines and diagnostics. Genomics England note that their legacy will be 'a genomics service ready for adoption by the NHS, high ethical standards and public support for genomics, new medicines, treatments and diagnostics and a country which hosts the world's leading genomics companies.'⁽⁶⁾

UK institutions are also participating in a broad range of international collaborations to translate genomic science into products that will improve health. One example is the Structural Genomics Consortium (SGC), a global public-private partnership to support the discovery of new medicines through focusing on genomics. The SGC operates from three academic institutions, the University of Oxford, University of Toronto and Universidade Estadual de Campinas in Brazil, and has 15 partners including the Wellcome Trust and GlaxoSmithKline (GSK).⁽⁷⁾

There are also a broad range of initiatives in the UK looking beyond the human genome to bring personalised medicine to patients. One example is the MRC-NIHR Phenome Centre based at Imperial College London which is analysing around 100,000 blood and urine samples every year to discover how our genes interact with our environment (our phenomes), to help determine the causes of disease and how treatments can be tailored for individual patients.⁽⁸⁾ The NIHR Rare Diseases Translational Research Collaboration (TRC) brings together genomic analysis with a detailed analysis of physical characteristics ('deep phenotyping') to ensure that the UK remains at the cutting edge of research into rare diseases, bringing together researchers with the NHS and life sciences companies to develop tailored interventions to prevent or treat these diseases.⁽⁹⁾ The Babraham Institute in Cambridge and Edinburgh University are global leaders in epigenetic research, looking at the causes of changes in gene expression other than changes in the genotype.⁽¹⁰⁾ Finally, the UK Biobank, a collaboration between the state, charity and academic actors, has recruited 500,000 people to take part in a project to improve the prevention, diagnosis and treatment of a broad range of serious illnesses. Part of what it will do is to use samples of blood stored from participants to allow scientists to study genes, and the complex interaction of genes, lifestyle and environment on disease.⁽¹¹⁾

Advances made in these initiatives will contribute to the growth of 'precision medicine', minimising side effects and improving health outcomes for patients in the UK and across the world. This market is projected to grow to £50-60bn and the Government is actively working to develop the UK into the global leader in this field.⁽¹²⁾

Malaria

The UK has a long history in leading the fight against malaria, stretching back to Sir Ronald Ross' Nobel Prize in 1902 for the discovery that the disease was transmitted by mosquitoes. Today, the UK makes an enormous contribution through its investments in research, prevention, diagnosis and treatment, working in collaboration with partners across the world and affected countries. Key players include the Department of International Development (DFID), the MRC, the Wellcome Trust and other foundations, universities, NGOs, businesses such as GSK and the UK public through their donations and support.

The UK's commitment as the first G7 nation to spend 0.7% of national income on aid and its longstanding commitment to tackling malaria makes it the second largest donor to fighting malaria in the world. UK funding tripled between 2008 – 2014, reaching an estimated £536m, and this has made a significant contribution to the estimated 47% reduction in mortality from malaria since 2000.^(13, 14) However, the burden of disease from malaria remains enormous, with almost 200 million cases in 2013 and 584,000 deaths, the majority of these in children under 5 living in sub-Saharan Africa.⁽¹⁵⁾ This has also had a significant impact on economic growth, with malaria estimated to have slowed growth in Africa by 1.3% per year since 1965. This has led to GDP in Africa in the year 2000 being as much as one-third lower than it might have been.⁽¹⁶⁾

DFID is widely recognised as a leading donor agency in tackling malaria, both through its research funding for malaria and its country programmes. DFID's bilateral programmes support governments of malaria-affected countries to prevent and treat malaria through improvements in capacity, project planning and coordination, drug and net distribution and demand creation. DFID also makes a strong contribution to fighting malaria through its funding of multilateral agencies such as the Global Fund to Fight AIDS, TB and Malaria (GFATM), the WHO and the Roll Back Malaria Partnership. GFATM accounts for 50% of the global spend on malaria and has distributed over 450 million insecticide-treated nets to protect families against malaria. The UK has made a significant contribution to this as the 3rd largest donor to GFATM since its creation and the 2nd largest donor since 2014, pledging up to £1bn between 2014-16.⁽¹⁷⁾

UK research funding has also made a huge contribution to reducing the burden of disease from malaria. Over the last ten years, the Wellcome Trust has funded over £150m of research on malaria, including through its 'Major Overseas Programmes' in Kenya, Malawi and South-east Asia. It has also made a major investment in the Wellcome Trust Sanger Institute Malaria Programme, focusing on using genome sequencing to open up new routes to drug and vaccine development.⁽¹⁸⁾ The MRC also has a long history in combatting malaria, for example showing that insecticide treated bednets reduced children's deaths by 63% in 1989, and making significant investments since into new treatments and approaches to reducing the number of deaths from malaria.⁽¹⁹⁾

UK universities have played a central role in carrying out this research, including the London School of Hygiene & Tropical Medicine (LSHTM), the Liverpool School of Tropical Medicine (LSTM), the University of Oxford, Imperial College London and the University of Manchester. One of the most important contributions was the successful demonstration of the effectiveness of artemisinin for malaria by Professor Nick White from the University of Oxford, working with his team in Thailand. The team then went on to pioneer artemisinin combination therapy which is now the first-line treatment for malaria recommended by the WHO.⁽²⁰⁾ This was a significant breakthrough in the fight against malaria, contributing to major reductions in mortality from

malaria across the world.⁽²¹⁾ This stands next to the work of a broad range of UK institutions involved in the malaria research, from mathematical modelling to vaccine development, often working through international collaborations with leading academics from across the world. This work has led to significant improvements in the tools and approaches available in the fight against malaria.

Research funders including DFID, the Wellcome Trust and the MRC, together with UK universities have also had an enormous impact through building research capacity in countries with malaria over the last 20-30 years – ensuring more equitable partnerships and building up the local expertise necessary to allow the research to take place successfully. One example of this is the Wellcome-Gates funded Malaria Capacity Development Consortium (MCDC). This brings together five African and four European Universities, including LSHTM and LSTM, to build capacity in African universities to strengthen their role in malaria research and lead to new ways to control the disease that are sensitive to the local context.⁽²²⁾

GSK has also had a longstanding commitment to fighting malaria through increasing access to anti-malarials in endemic countries and investing over \$350m so far in developing the world's first vaccine candidate for malaria: RTS,S, which has now completed Phase 3 trials. This was also a collaborative effort, developed in partnership with the PATH Malaria Vaccine Initiative (MVI) and research institutions in Africa and other high-income countries. GSK have also committed over £4.8m to community initiatives in low-income countries, promoting the use of existing interventions such as bed nets, indoor residual spraying and anti-malarials.⁽²³⁾ In May 2015, a new malaria vaccine developed at Oxford University's Jenner Institute also showed promise in a Phase II clinical trial in Kenya, potentially providing a further route to fighting the global burden of disease from malaria.⁽²⁴⁾

Finally, UK NGOs remain at the forefront of working to secure access to prevention and treatment of malaria for those most at risk across the world. These include the Malaria Consortium, one of the world's largest malaria charities, Malaria No More UK, Against Malaria Foundation, and large INGOs such as Save the Children. These charities play a crucial role in securing access to tests, treatment and insecticide treated bednets for people at risk of malaria, as well as advocating for further global action to reduce the numbers of adults and children dying from malaria every year.

Neglected Tropical Diseases

The UK is a global leader in combatting the significant morbidity and mortality caused by neglected tropical diseases (NTDs). The WHO notes that there are 17 NTDs in total, affecting more than 1.4 billion of the poorest people in 149 countries across the world – more than a sixth of the world's population.⁽²⁵⁾ These are diseases of poverty, and contribute to further poverty in those they afflict through disability, stigma, reduced educational and employment opportunities as well as killing over 500,000 people per year. Common NTDs include schistosomiasis, lymphatic filariasis (LF - elephantiasis), blinding trachoma, and onchocerciasis (river blindness). A packet of drugs to treat and protect one person from these NTDs costs as little as \$0.40 per year.⁽²⁶⁾

In 2011, DFID demonstrated its commitment to NTDs through announcing a five-fold increase in spending on NTDs between 2011 and 2015, from £50m to £245m. This funding will protect more than 140 million people from priority diseases, including Guinea worm – contributing to making this the second human disease in history to be eradicated.⁽²⁷⁾ It has also made a significant contribution to other NTDs, including improving social inclusion and access to services for people with leprosy.

This commitment was followed in January 2012 by the largest coordinated effort to date to tackle NTDs – the London Declaration on NTDs – bringing together a broad range of partners including the WHO and World Bank, donors, foundations, NGOs, universities, pharmaceutical companies and endemic countries.⁽²⁸⁾ The goal was to advance the WHO's 2020 Roadmap on NTDs, and to commit to the elimination or control of 10 neglected diseases by 2020. There were 20 original organisations that endorsed the London Declaration, and this has now grown to over 85 organisations from across the world. Uniting to Combat NTDs is a collective of organisations and individuals committed to fulfilling the London Declaration 2020 goals and tracking their progress. Their 2014 report shows strong progress, with national NTD plans in more than 70 countries and pharmaceutical companies meeting 100 per cent of requests for drugs from endemic countries, with nearly 1.35 billion treatments donated in 2013. However, it also shows that there's still more work to be done, including widening the donor base to tackle NTDs to ensure full scale-up of the treatments required.⁽²⁹⁾ More recent investments in NTDs by the UK include £42.8m by the Queen Elizabeth Diamond Jubilee Fund in 2013 to combat blinding trachoma in Commonwealth countries, and \$50m Children's Investment Fund Foundation (CIFF) in 2014 to implement large scale deworming children.

The UK is the third largest funder of NTD research and development behind the USA and European Commission, with UK universities playing a key role in the fight against NTDs.⁽³⁰⁾ The Centre for Neglected Tropical Diseases (CNTD) at LSTM has broad, cross-sectoral expertise in research, implementation and capacity strengthening for NTDs, particularly LF/elephantiasis. In 2013, the London Centre for Neglected Tropical Disease Research was launched, a joint initiative of the Natural History Museum, LSHTM, the Royal Veterinary College, the Partnership for Child Development, the Schistosomiasis Control Initiative and Imperial College London. Each of these actors has strong expertise in tackling NTDs, and bringing them together will encourage collaborative working to accelerate progress: it is only through partnership working that the scale-up required will happen.⁽³¹⁾

In the NGO sector, Sightsavers is engaged in tackling all seven of the most common NTDs, but also leads a consortium of 20 partners on the £10.6m Global Trachoma Mapping Project (GTMP) funded by DFID. This is the world's largest infectious disease mapping project, working to complete the global aim of mapping of trachoma in over 30 countries, benefiting the 232 million people living in endemic regions. This will allow Ministries of Health and partners to plan coordinated programmes to ensure that treatment is focused where it's needed the most.⁽³²⁾ So far the project has mapped over 2.1 million people in over 22 countries, with the key to success being close collaboration with Ministries of Health who play a central role and provide healthcare workers. In its three years, partnerships have snowballed with new countries approaching the GTMP to map in their country. The GTMP has developed a 'gold standard' for data capture using mobile technology that is being imitated by other programmes, its methodology has been adopted by other trachoma surveys and new collaborations are forming to map other NTDs. It has given 900 health workers additional skills, provided accurate data to guide Ministries, NGOs and donors and allowed pharmaceutical companies to see what antibiotics are needed where and when.⁽³³⁾

In addition to Sightsavers, UK NGOs engaged in reducing the burden of disease from NTDs include Orbis, CBM, Lepira, the Leprosy Mission, WaterAid, Save the Children, the Malaria Consortium and many others. The UK Coalition against NTDs is a collaborative partnership between UK organisations actively engaged in NTDs, and brings together many of these NGOs and academic actors to advocate for effective global action against NTDs.

In the commercial sector, the UK companies GSK and AstraZeneca joined the world's largest pharmaceutical companies in signing up to the London Declaration in 2012, making an estimated \$19bn of drug donations through to 2020. GSK has pledged to donate albendazole for as long as necessary to eliminate LF/elephantiasis, currently 600 million tablets per year, as well as providing 400 million tablets per year to treat school-age children at risk of intestinal worms. GSK also engages in significant R&D through its centre in Spain dedicated to research on NTDs, malaria and TB. It was also a founding member of WIPO Re:Search, working together with seven other leading pharmaceutical companies and the US National Institutes of Health under the auspices of the World Intellectual Property Organisation (WIPO) to accelerate the development of treatments against NTDs.⁽³⁴⁾ Both GSK and AstraZeneca are also partners of the Drugs for Neglected Diseases initiative (DNDi), a product development partnership developing new treatments for NTDs.⁽³⁵⁾

Antimicrobial Resistance (AMR)

Antimicrobials are drugs developed to fight bacteria (antibiotics), viruses (antivirals), fungi (antifungals) and parasites (including antimalarials). They've been in use for less than a century, and in that time have totally transformed the treatment of infectious diseases – from the discovery of penicillin by Sir Alexander Fleming in 1928, to the development of AZT by Burroughs Wellcome (now GSK) and others – the first drug approved to treat HIV/AIDS. However, there hasn't been a novel class of antibiotics in over 25 years, and there is increasing resistance to existing drugs, threatening to turn back the clock on this progress.⁽³⁶⁾ Estimates of deaths from antimicrobial resistance (AMR) run at 25,000 per year in Europe and 23,000 per year in the USA, with rising drug resistance in TB, malaria and HIV endangering the progress made in tackling these diseases.⁽³⁷⁾ The WHO notes that 'without urgent, coordinated action, the world is heading towards a post-antibiotic era, in which common infections and minor injuries, which have been treatable for decades, can once again kill'.⁽³⁸⁾

The Chief Medical Officer (CMO) of England Professor Dame Sally Davies has been a key figure internationally in driving forwards global action on AMR, for example through chairing the WHO Strategic and Technical Advisory Group on Antimicrobial Resistance (STAG-AMR). The CMO's 2011 Annual Report 'Infections and the rise of antimicrobial resistance' recommended global leadership and action, particularly around the development of new antibiotics and preserving the effectiveness of existing antibiotics; improving education and awareness around AMR; better surveillance systems and better diagnostic technology for infection.⁽³⁹⁾ Following this, the cross-government 'UK Five Year Antimicrobial Resistance Strategy 2013 to 2018' was published, confirming the UK's leading role in national and international action on AMR.⁽⁴⁰⁾ This strategy placed at its centre the 'One Health' approach spanning people, animals, agriculture and the wider environment, recognising the importance of antibiotic stewardship by veterinary professionals. In addition to key roles for state bodies such as the DH, Public Health England (PHE) and the Department of the Environment, Food and Rural Affairs (Defra), it also focused on the need for global action, working together with the WHO, EU and other international partners. One example of this was calling G8 countries' science ministers together for the first time in five years in 2013 to discuss the issue of AMR.⁽⁴¹⁾

The first annual progress report published in 2014 shows that good progress has been made, including the UK and Sweden leading the development and adoption of a World Health Assembly Resolution on AMR, requiring the WHO to develop a draft global action plan by May 2015.⁽⁴⁰⁾ The resolution had the 'One Health' approach at its core, and implementation will require member states to commit to developing

national action plans and strengthening capacity in tackling AMR.⁽⁴²⁾ Together with partners, the UK has also led the development of the AMR 'Action Package' within the Global Health Security Agenda, working to build on the WHO process to support the development of comprehensive national plans with yearly reporting and strengthened surveillance and laboratory capacity across the world.⁽⁴³⁾ The UK think tank Chatham House has also played a key role through running a series of roundtables and conferences on AMR since 2011, convening global experts to take the debate forwards.⁽⁴⁴⁾

UK charities and foundations are also making an important contribution to AMR. In 2014, the £10m Longitude prize was awarded to antibiotics by public vote, beating five other topics. This prize was developed and run by NESTA, a UK charity that works to increase the innovation capacity of the UK, together with Innovate UK as a funding partner.⁽⁴⁵⁾ The Wellcome Trust has awarded over £170m in grants covering a broad range of research related to AMR, from basic science to translational research on drug discovery and innovation.⁽⁴⁶⁾ They are also hosting and funding a major international economic review on AMR, looking at how to incentivise the drug pipeline so that new drugs are developed in addition to making better use of existing antimicrobials to treat illness. This will be chaired by the leading economist Jim O'Neill with support from the Department of Health and HM Treasury.⁽⁴⁷⁾ The Government is also working with the Wellcome Trust and other global partners to tackle AMR in low- and middle-income countries (LMICs) through the Fleming Fund, a £195m fund to build laboratory capacity, surveillance networks and response capacity in LMICs.⁽⁴⁶⁾

In addition to the Wellcome Trust, the UK has a broad range of key funders and stakeholders supporting AMR research in the UK, coming together under the Antimicrobial Resistance Funders' Forum (AMRFF).⁽⁴⁸⁾ This includes the seven Research Councils, the NIHR, the Wellcome Trust and key Government agencies. The MRC is also leading, on behalf of the UK, the EU Joint Programming Initiative on AMR which aims to coordinate research activity across 17 member states, Norway, Switzerland, Canada, Israel and Turkey.⁽⁴⁰⁾ The Research Councils have come together to coordinate the work of medical researchers, biologists, engineers, vets, economists, social scientists and designers to tackle this issue using an interdisciplinary approach.⁽⁴⁹⁾ UK universities have played the central role in carrying out this research, however they have also worked closely with industry partners from large pharmaceutical companies and small and medium sized biotechnology companies to translate research findings into new products. The UK pharmaceutical companies GSK and AstraZeneca are also participants in the EU Innovative Medicines Initiative (IMI) project to combat AMR, a partnership between industry, academia and biotech organisations. This is driving forward action to develop new antimicrobials, a major strand of the strategy to tackle AMR.⁽⁵⁰⁾

2. The State Sector

What do we mean by the state sector?

The 'state sector' encompasses all branches of Government, from the Prime Minister to the civil service and 'arms-length' bodies that are publicly funded. These actors make a major contribution to improving health globally: through leadership in health issues at the global level; engaging in country-level action to improve health overseas; and through creating an enabling environment that supports the commercial, academic and not-for-profit sectors to contribute to better health across the world.

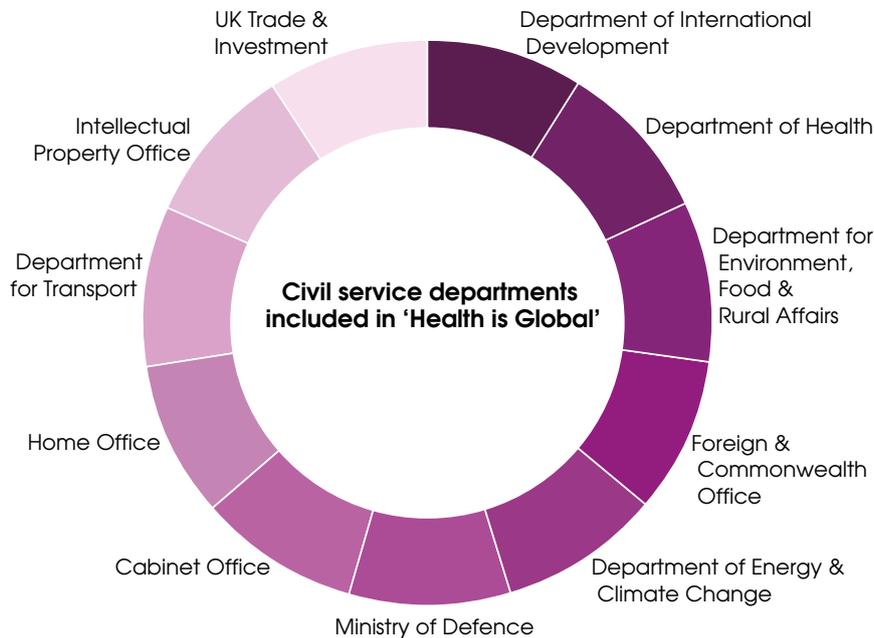
With regard to leadership in health at the global level, this includes government policy on global health, as well as leadership on specific health issues on the global stage. With regard to the country-level action to improve health overseas, this comprises two areas: the Department for International Development (DFID) and its spend on health; and the National Health Service (NHS) and supporting actors in the UK health system. Whilst the latter group of actors are primarily focused on improving health in the UK, they also have a significant global footprint that contributes to improving health abroad and the UK's global reputation in health. Some of these actors are not publicly funded such as the Royal Colleges and the GMC, but they are included in this chapter as their primary roles relate to supporting the NHS to deliver quality healthcare. With regard to creating an enabling environment for the other sectors, these bodies are described further in the relevant chapters, but are highlighted in Figure 1.

Figure 1: State sector actors that support other sectors to improve health globally

Academic sector	Commercial sector	Not-for-profit sector
<ul style="list-style-type: none"> Higher Education Funding Council for England Scottish Funding Council Higher Education Funding Council for Wales Department for Employment & Learning NI National Institute for Health Research Chief Scientist Office (Scotland) National Institute for Social Care & Health Research (Wales) Northern Ireland Clinical Research Network Research Councils UK Department for International Development 	<ul style="list-style-type: none"> Healthcare UK Office for Life Sciences UKTI Life Sciences Organisation Scottish Development International Business Wales Invest Northern Ireland Innovate UK MHRA HM Revenue & Customs Intellectual Property Office 	<ul style="list-style-type: none"> Charities Commission Office of the Scottish Charity Regulator The Charity Commission for Northern Ireland HM Revenue & Customs Department for International Development

It is also important to note that the contribution of the state sector to improving health globally is bigger than just the actors described above. For example, Figure 2 shows the civil service departments as having a responsibility for delivering global health outcomes in the UK global health strategy 'Health is Global'.⁽⁵¹⁾

Figure 2: Civil service departments included in 'Health is Global'



Looking across these departments highlights how the UK's impact on health outcomes across the world are determined not only by actions directed at improving health, but by a broad range of policy areas that are not within the scope of this report. Two examples of this are climate change and trade policy, with The Lancet describing climate change as 'the biggest global health threat of the 21st century', and highlighting: 'the fact trade directly and indirectly affects the health of the global population with an unrivalled reach and depth undoubtedly makes it a key health issue that the global health community can no longer ignore.'^(52, 53) Accordingly, whilst the focus of this chapter is on state activity directed towards improving health, it is important to keep in mind that this is only part of the contribution of the UK state sector to health across the world.

Outline of chapter

As shown in Figure 3, the state sector has three main areas. This chapter will consider each of these in turn, beginning with Government policy and global leadership in improving health, then moving onto the NHS and actors in the UK health system, and finally looking at DFID. For each part of the UK health system, their role in the UK will be described briefly before mapping their contribution to improving health globally. For DFID, its role and reputation will be described before mapping its contribution to improving health through its aid spending and its influence on the global stage. Finally, the chapter will conclude by bringing together the contribution of the state sector to improving health and shared prosperity across the world, as well as the challenges and opportunities looking to the future.

Figure 3: Outline of the state sector

State sector		
Government policy & global leadership	NHS & supporting actors	DFID & its role in international health
Government policy	DH, NHS & arms-length bodies	Bilateral programmes
Leadership at the global level	NGOs that support volunteering	Supporting multilateral organisations
	Royal Colleges	Influencing global health policy
	Professional regulators	International health research
	Trade unions & professional bodies	

Government policy and global leadership in health

Cross-governmental global health strategy

The UK was the first country in the world to publish a truly cross-governmental strategy for global health with the launch of: ‘Health is Global: A UK Government Strategy 2008-13’.⁽⁵⁴⁾ This was followed with a framework to support the next phase of the strategy: ‘Health is Global: An outcomes framework for global health 2011-15’.⁽⁵¹⁾ These reports highlight the UK’s commitment and the benefits of government departments working together towards improving global health, both for the UK and for shared prosperity across the world.

“ Our responsibility is to harness the opportunities of globalisation to improve the health of people across the world, and in particular people in the UK.

A healthy population is fundamental to prosperity, security and stability – a cornerstone of economic growth and social development. In contrast, poor health does more than damage the economic and political viability of any one country – it is a threat to the economic and political interest of all countries. ”

Health is Global Strategy 2008-13

The original strategy outlined areas of action to achieve greater coherence and consistency between international and domestic policies that affect global health. The follow-up outcomes framework narrowed these into three main outcomes: global health security, international development and trade for better health. These were developed into 12 indicators illustrated in Figure 4, with departments across government responsible for achieving them, highlighting the importance of cross-governmental working.

Figure 4: Summary of 'Health is Global: an outcomes framework' indicators

		Departments	
		Leading	Supporting
Outcome 1: Global health security	MDGs - food & water security	DFID DECC MoD Cabinet Office DH Defra	DFID DH FCO DECC Defra
	Climate change		
	Health & conflict		
	Emergency preparedness		
	Research		
Outcome 2: International development	MDGs - health systems & delivery	DFID DH	DFID DFT Defra DH DECC Home Office
	Non-communicable diseases		
	Learning from other countries		
	Research		
Outcome 3: Trade for better health	Trade & investment	DFID UKTI	IPO DH FCO
	MDGs - access to medicines		
	Research		

Source: HM Government, Health is Global: An outcomes framework for global health 2011-2015. MDGs: Millennium Development Goals; DFID: Department for International Development; DECC: Department of Energy & Climate Change; MoD: Ministry of Defence; DH: Department of Health; Defra: Department for Environment, Food & Rural Affairs; FCO: Foreign & Commonwealth Office; DFT: Department for Transport; UKTI: UK Trade & Investment; IPO: Intellectual Property Office:

An external review of the effectiveness of the original strategy undertaken in 2010 was largely positive, and it has been used as an example of good practice internationally by other countries and institutions, for example the European Commission using the strategy as a blueprint for developing its 'Commission Communication on Global Health'.⁽⁵⁵⁾ Of the countries that have developed a formal global health strategy, the UK's remains the most detailed and comprehensive.⁽⁵⁶⁾ Of note, the outcomes framework runs between 2011-2015, and and interviewees highlighted the need to refresh the strategy in order to reaffirm the importance of cross-governmental working and the UK's commitment to improving health across the world.

In addition to the global health strategy, the other major government policy for strengthening the UK's role in health globally is the 'Strategy for UK Life Sciences'. Its goal is to build on the UK's strong heritage in life sciences to make it a global hub for life sciences in the future, bringing together business, researchers, clinicians and patients to translate discovery into clinical use for medical innovation in the NHS and across the world. This is discussed further in Chapter 4.

All-Party Parliamentary Groups (APPGs)

APPGs are informal, cross-party interest groups whose fields of interest range from fostering links with specific countries and parliaments, to addressing specific subjects including health, education, religion and many others. They are Parliamentary and not Governmental bodies. There are over 600 APPGs, and over 80 that focus on health, including the APPG on Global Health which commissioned this report.

APPGs have strong convening power which they use to connect parliamentarians with academia, civil society and industry partners in their respective areas. This allows them to draw together a range of expert views and present these to Parliament to improve UK decision-making in these areas, noted to be a strength of the UK system.

From the perspective of improving health in low- and middle-income countries (LMICs), in addition to the APPG on Global Health, key APPGs include: Malaria and Neglected Tropical Diseases (NTDs); HIV and AIDS; Population, Development and Reproductive Health; Tuberculosis; and Water and Sanitation in the Third World. In addition to these APPGs, the remainder of the 80 APPGs focused on health in the UK, such as specific cancers and chronic diseases, mental health, medical research and antibiotics, all play an important role in improving UK health policy and action in these areas.

Global leadership in health

The UK has demonstrated global leadership in raising the profile of health issues in international fora such as the G7/G8, the EU and the WHO. The cross-sectoral case studies in Chapter 1 showcase the UK's leadership in global action on malaria, neglected tropical diseases (NTDs), antimicrobial resistance (AMR) and genomics. However, the UK Government's global leadership in health goes beyond these case studies, including for example patient-centred care and patient safety, dementia and the cross-governmental response to Ebola.⁽⁵⁷⁾ DFID has also taken a significant role in global health leadership, and this is discussed in further detail in this chapter. The UK's contribution to the global challenge of dementia and the Ebola outbreak are described here.

Dementia

The UK used its presidency of the G8 in 2013 to launch the first G8 Dementia Summit, with dementia affecting an estimated 47.5 million people across the world, estimated to more than triple by 2050. It costs more than \$600bn globally and with almost 60% of people with dementia living in LMICs, this is set to rise rapidly as life expectancy increases across the world.⁽⁵⁸⁾ The Summit brought together ministers, researchers, pharmaceutical companies and charities, leading to a declaration committing the G8 countries to joint action to tackle dementia.⁽⁵⁹⁾

This led to the first WHO Ministerial Conference on Dementia in March 2015, supported by the DH and the Organisation for Economic Cooperation and Development (OECD), further catalysing global action on dementia. At this conference, the UK announced a \$100m Dementia Discovery Fund as an innovative method for financing dementia research, with the ultimate aim of developing new drugs to treat the condition.⁽⁶⁰⁾ The UK has committed to being both the best

country in the world for dementia care, and the best place in the world to undertake research into dementia and other neurodegenerative diseases by 2020, consolidating the leadership shown at the global level.⁽⁶¹⁾

Leadership in dementia has also been shown by UK charities, research funders, businesses and universities. Examples of this include Alzheimer's UK launching a £100m campaign over five years dedicated to taking promising new treatments into testing in people, and the Medical Research Council (MRC) announcing the world's biggest study into dementia involving two million people through the UK Dementias Platform (DPUK).⁽⁶²⁾ DPUK is a partnership between the MRC and six companies, linking industry partners including GlaxoSmithKline (GSK) and MedImmune (a branch of AstraZeneca) with academics to develop new approaches and drugs for treating people with dementia. The executive team of investigators are drawn from seven UK universities, with further universities linked in to the partnership.⁽⁶³⁾

The Ebola outbreak

The 2014 Ebola outbreak in West Africa is the largest in history, with over 26,000 cases and over 11,000 deaths.⁽⁶⁴⁾ The size of the outbreak required an enormous international response, with the UK, USA and France leading in Sierra Leone, Liberia and Guinea respectively, working closely with the WHO. The UK has committed £427m to support these efforts, in addition to its support to international agencies such as the World Bank, the UN's Central Emergency Response Fund (CERF) and regular cargo flights part-funded by the EU.⁽⁶⁵⁾ The Children's Investment Fund Foundation (CIFF) also committed \$20m as part of its humanitarian funding portfolio.⁽⁶⁶⁾

Whilst DFID has led the UK response, ten Whitehall departments and four arms-length bodies have played key roles in bringing the outbreak under control, including the MoD, FCO, DH, the NHS and Public Health England (PHE). The FCO has encouraged countries around the world to join the response, and the MoD has provided over 800 personnel, helping to establish six new Ebola treatment centres and a WHO-led Ebola training academy to assist in the training of over 4,000 healthcare workers. These treatment centres have taken the number of treatment and isolation beds supported by the UK to over 1,400, more than half the beds available for Ebola patients in Sierra Leone. The MoD has also provided three Merlin helicopters to facilitate the rapid movement of key personnel, and an aviation support ship operating as a forward base.^(67, 68)

Over 150 NHS health professionals have been deployed to support the response to Ebola through the charity UK-Med which coordinates the register of trained volunteers, out of over 1,600 who have volunteered. PHE have deployed over 100 staff to run three new laboratories, reducing the turnaround time for samples from 4-5 days to less than 24 hours, leading to a fall in the number of people contracting the disease. PHE epidemiologists have also provided expert advice to the Sierra Leone Ministry of Health on managing the outbreak. In addition to these activities, the UK has also provided emergency supplies such as food aid, blankets, medical supplies, chlorine and protective clothing for thousands of workers; opened around 200 community care centres for swift diagnosis and supportive care; supported more than 100 burial teams to ensure safe burials that also allow people to honour their friends and relatives; and strengthened the capacity of the Government of Sierra Leone to manage the outbreak and rebuild the health system to be resilient to future threats.⁽⁶⁵⁾

Part of this funding has gone to international partners on the front-line such as the WHO, UNICEF and the International Federation of the Red Cross (IFRC); and NGOs such as Médecins Sans Frontières (MSF), Save the Children and the

International Rescue Committee (IRC). The UK has worked through the Social Mobilisation Action Consortium including GOAL, the US Centers for Disease Control (CDC), Restless Development, BBC Media Action and Focus 1,000 to promote community action based prevention, safe burials, reintegration of survivors into communities and awareness of Ebola through accurate media coverage.⁽⁶⁹⁾ The UK has also played a key role in Ebola vaccine research and development, with DFID, the MRC and the Wellcome Trust providing funding for clinical trials; universities such as the London School of Hygiene & Tropical Medicine (LSHTM) and Oxford University Jenner Institute playing key roles in coordinating the trials with international partners; and GSK working together with the US National Institutes of Health (NIH) to develop one of the most promising vaccine candidates.⁽⁷⁰⁾

The international response to the Ebola crisis has been successful in bringing the outbreak under control. The outbreak in Liberia was declared over on 9th May 2015, and there were 24 confirmed cases in Sierra Leone and Guinea reported in the week to 14th June 2015, down from hundreds per week at its peak.⁽⁷¹⁾ However, there are important lessons to be learned from the response, and a major task ahead of rebuilding the health systems in these and other countries to ensure resilience to public health emergencies in the future. The lesson-learning has already started, for example through the 'House of Commons Committee of Public Accounts Report: The UK's response to the outbreak of Ebola Virus Disease in West Africa.'⁽⁷²⁾ This criticised the international community and the UK for being too slow to recognise the seriousness and respond to the outbreak, as well as the Government's decision to prevent direct flights to the region from the UK which likely increased the cost and difficulty of dealing with the outbreak. There was broad agreement amongst interviewees that whilst the UK played a central role in leading the international response, particularly in Sierra Leone, due attention must also be given to its failures and the root causes of the epidemic to ensure a more effective response in the future.

The NHS and actors in the UK health system

Overview

A strong health system plays a critical role in ensuring the health of a population, from mental health to physical health, from maternal and child health to elderly care, from emergency care to monitoring of long-term conditions. This requires elements that are highly visible, such as skilled health workers, health facilities, medicines and equipment. However, it also requires elements that are less visible but nonetheless critical to the proper functioning of the system, such as systems of regulation, training and financing; health information systems; and strong leadership and systems of clinical governance. Furthermore, these technical components need to be considered together with the people within the system, and their inter-relating roles, interests, values and networks that help shape the health system. The Ebola epidemic and the rising prevalence of non-communicable diseases (NCDs) such as diabetes and cardiovascular disease also reminds us that a strong health system needs more than just the ability to treat patients, it also needs strong public health capacity: for surveillance and control of infectious diseases and other risks to health, and to prevent disease from occurring in the first place. The UK health system has expertise across all of these areas. Elements of this system have been replicated in different countries with varying levels of success, but increasingly UK actors are extending their expertise in a more targeted way to improve the quality of health systems across the world.

The UK health system is often referred to as 'the NHS'. In fact, there are hundreds of organisations that make up the NHS, and many more that support it to work effectively and efficiently to deliver quality care to patients in the UK, and indeed to take this expertise to improve health abroad. There are two main categories of

these actors: those that are publicly funded through the Government, including NHS organisations and those funded by the DH such as the National Institute of Health and Care Excellence (NICE) and Public Health England (PHE); and those that are funded through other routes, primarily through membership and subscription fees from the professionals that they regulate such as the Royal Colleges and the General Medical Council (GMC). In addition to these two groups, it is also important to highlight the role that NGOs play in supporting British healthcare workers to work overseas in other health systems, and to provide medical assistance during humanitarian emergencies.

The NHS International Health Group meets quarterly, bringing together actors from all of these groups to share their activities in international health. Whilst the group was described by interviewees as an effective forum for sharing information and keeping up to date with activities in international health, it was noted that it was not as yet an effective forum for coordinating or promoting further involvement of members overseas.

This section will consider each of these groups of actors, who they are and how they fit into the system, and their contribution to improving health outside the UK.

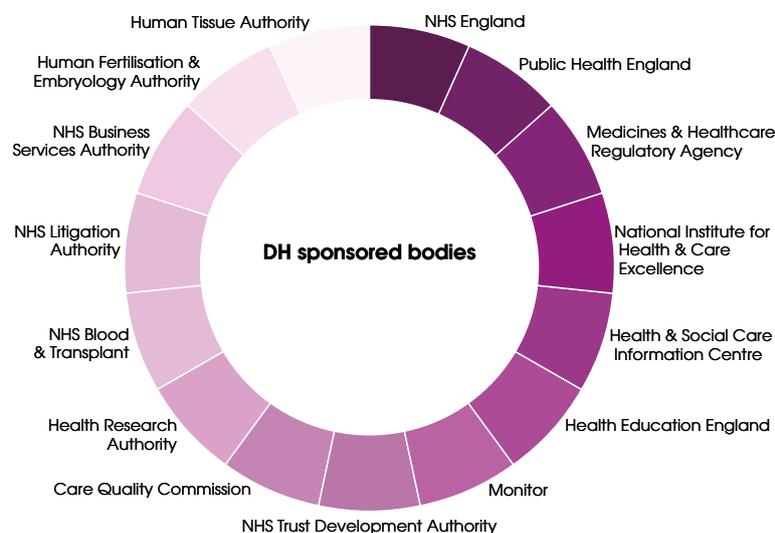
Publicly funded health actors

Introduction

Healthcare is a devolved responsibility in the UK, and so the health systems of England, Scotland, Wales and Northern Ireland operate largely independently from one another (with some mutual support). The DH provides funding and stewardship for the delivery of quality healthcare through NHS England, and the devolved governments provide the same for NHS Scotland, NHS Wales and Health and Social Care Northern Ireland (HSCNI). The structure of the NHS in each country varies considerably, and indeed there are four Chief Medical Officers advising their respective governments. Where not specifically delineated by country, 'the NHS' refers to the health service across all four countries of the UK.

In addition to the NHS bodies involved in healthcare delivery, the DH also funds two Executive Agencies and 13 arm's length bodies that support the NHS to provide efficient high quality services and deliver improved health, illustrated in Figure 5.

Figure 5: DH sponsored bodies



All of these bodies support the NHS to function effectively, and therefore contribute to its global footprint. However, some of these also make their own contribution to improving health globally, either through acting as a model of best practice, or through engaging directly with countries to improve the quality of their health systems.

The DH also has an International Department that coordinates its international engagement. They are the lead agency for the UK's engagement with the WHO, including on AMR, WHO reform, food regulation, tobacco, pandemic flu preparedness and other areas. They also engage with the Commonwealth, OECD health committee, G7/8 and G20, for example leading the UK's role in highlighting the challenge of dementia globally; and lead on the UK's relationship with the EU on health, including influencing pan-European legislation and engaging in joint actions with other Member States to share best practice. They are also engaged in bilateral relationships that are not based on 'development', particularly with middle-income countries including Brazil, China, India, South Africa and Mexico. These relationships are as much about what the UK can do to support health in these countries as they are about what we can learn, for example investigating whether healthcare coverage can be improved in the UK through piloting the Brazilian community health worker model in Wales.⁽⁷³⁾

The NHS

The NHS in the UK

The NHS was founded in 1948 on three principles that remain its core values to this day: a health system that meets the needs of everyone, free at the point of delivery, based on clinical need, not ability to pay. These values are highly respected by actors from across the world, and alongside primary care in the UK are central to the high regard and demand for UK expertise abroad. The expertise in primary care in particular was highlighted by interviewees as critical to tackling the growing burden of NCDs and providing cost-effective healthcare.

“ The actual principles of universal healthcare coverage, and having the GPs as a gatekeeper, and looking holistically and offering person-centred care are valued internationally hugely ”

Today, the NHS is the largest publicly funded healthcare system in the world, spending over £124bn across the UK, covering a population of over 64m people.^(74,75) It is also one of the largest employers in the world, and the largest in Europe, employing over 1.6m people in the UK across more than 300 different careers.^(76,77)

The US-based Commonwealth Fund ranked the UK as having the top healthcare system in the world in 2014, illustrated in Figure 6. The study looked at quality of care, access to care, efficiency, equity and healthy lives across 11 high-income countries, and the UK ranked 1st for all measures of quality, including effectiveness, safety, coordination and patient-centredness of care. It also ranked top for efficiency – with only New Zealand spending less on healthcare per capita – and in the top 3 for access and equity. It did, however, rank 10th for 'healthy lives', looking at mortality amenable to medical care, infant mortality and healthy life expectancy at 60.⁽⁷⁸⁾

Figure 6: Commonwealth Fund comparison of health systems in high-income countries

	Aus	Can	Fra	Ger	Neth	NZ	Nor	Swe	Swiz	UK	US
Overall ranking (2013)	4	10	9	5	5	7	7	3	2	1	11
Quality care	2	9	8	7	5	4	11	10	3	1	5
Effective care	4	7	9	6	5	2	11	10	8	1	3
Safe care	3	10	2	6	7	9	11	5	4	1	7
Coordinated care	4	8	9	10	5	2	7	11	3	1	6
Patient-centred care	5	8	10	7	3	6	11	9	2	1	4
Access	8	9	11	2	4	7	6	4	2	1	9
Cost-related problem	9	5	10	4	8	6	3	1	7	1	11
Timeliness of care	6	11	10	4	2	7	8	9	1	3	5
Efficiency	4	10	8	9	7	3	4	2	6	1	11
Equity	5	9	7	4	8	10	6	1	2	2	11
Healthy lives	4	8	1	7	5	9	6	2	3	10	11
Health expenditures/capita (2011)	\$3,800	\$4,522	\$4,118	\$4,495	\$5,099	\$3,182	\$5,669	\$3,925	\$5,643	\$3,405	\$8,508

Source: Reproduced from: Davis K, Stremikis K, Schoen C, et al. Mirror, Mirror on the wall, 2014
 Update: How the US Health Care System Compares Internationally. The Commonwealth Fund, 2014

The NHS also faces considerable challenges common to health systems in all high-income countries. There is an unprecedented demand for healthcare driven by growth in medical technologies, the rising burden of long-term conditions, a growing and ageing population and rising public expectations. These factors have combined to create a significant funding gap, projected to reach £30bn by 2020, and well-reported challenges to delivering healthcare in line with the original core values of the NHS.⁽⁷⁹⁾ With 11% of all staff and 26% of doctors in the NHS coming from abroad, many interviewees also raised the recent trend in immigration reform as a major threat to the NHS.⁽⁸⁰⁾ This clearly has consequences for the health of the British population, but many interviewees highlighted how this also presents a threat to the way the UK is perceived across the world with regard to expertise in healthcare.

Additionally, despite the strengths of the NHS, some interviewees highlighted that a weakness for the UK when engaging in health systems strengthening is an over-reliance on the NHS model, and a lack of understanding of other ways of delivering and funding healthcare. A danger of this is that we can end up ‘doing harm’ through imposing our model on countries where the tax base or other structural factors are inadequate to support it. A key challenge identified was how to effectively utilise the wealth of experience from the NHS model of care where applicable and relevant, and the values of universal healthcare, without ‘imposing’, or being seen to impose the NHS model.

“ Because of the NHS we’re very strong when we go global on things like primary health care, but have a strong weakness with regard to the delivery of health through the private sector ”

How does the NHS improve health globally?

The NHS contributes to improved health globally through four main channels: through its contribution to research and academia; through training health professionals from abroad; through overseas links made on a commercial basis; and through volunteering and philanthropic partnerships with institutions in low and middle income countries (LMICs).

Contribution to research and academia

As discussed in further detail in Chapter 3, the UK is a world leader in health teaching and research, a global public good. It is the NHS that trains the doctors and health professionals that provide this teaching and carry out clinical research, as well as providing the context for them to innovate and find more effective ways of working to improve patient outcomes. Furthermore, it is the NHS that provides the patients and health information systems to carry out clinical trials. This research and best practice is then shared through publications in international journals and participation in international conferences, both in the UK and abroad.

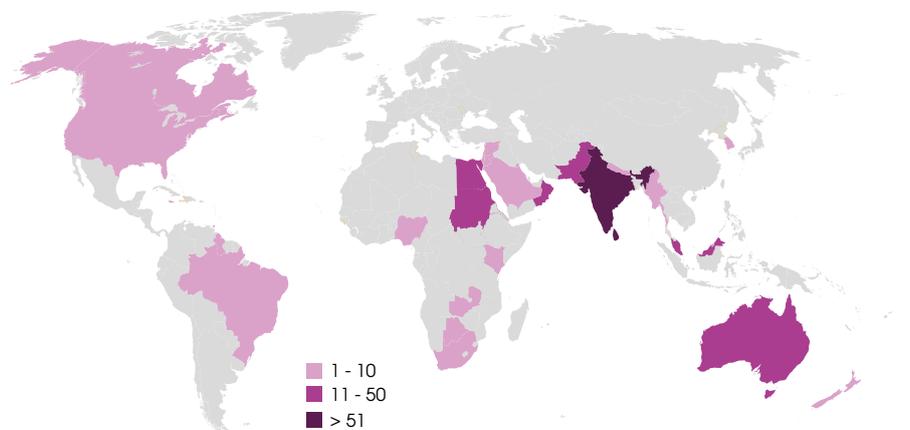
Training health professionals from abroad

NHS hospitals host doctors from abroad for defined periods, training them to develop the skills and expertise to provide high-quality care and treat complex conditions that they can then take back to improve healthcare in their own countries. These doctors come from both high-income countries (HICs) and LMICs, and examples include international clinical fellows at world-leading specialist centres such as Great Ormond Street Hospital, and the Scottish International Medical Training Fellowships scheme for experienced doctors close to completion of their training.

The Medical Training Initiative (MTI), launched by DH in 2009, is another major initiative in this area. It provides doctors, predominantly from LMICs, with a period of training and development in the NHS for up to two years. They then return to their home countries where their patients and colleagues can benefit from the skills and experience they have obtained in the UK.⁽⁸¹⁾ Strict governance procedures are in place to ensure that the system does not act as a 'brain drain' or a tool for NHS Trusts to fill non-training posts, for example a five year gap after the initial placement before reapplying, and the appointment of an educational supervisor to ensure that they are learning and developing throughout their time in the NHS.

The MTI scheme operates through a partnership between the Academy of Medical Royal Colleges (AoMRC) and its constituent members, the GMC, NHS Trusts, Local Education and Training Boards (LETBs) and the DH. The number of new MTI placements was 230 in 2010, 280 in 2011 and 288 in 2012, with 438 active placements in 2013 across 36 countries.⁽⁸²⁾ Of these, 69% were from LMICs, and 4% were from sub-Saharan Africa. The placements by country of origin are illustrated in Figure 7.

Figure 7: Country of origin of active MTI placements in January 2013



Source: GMC, Medical Training Initiative Database, 2014

Overseas commercial links

A third channel through which the NHS contributes to health abroad is overseas links that NHS hospitals have on a commercial basis, with the profits reinvested in improving public services in the UK. There are different models for this, including seeing international patients in London, setting up overseas units and partnering with overseas institutions to support them to develop their clinical services. Specific examples include:

Great Ormond Street Hospital (GOSH)

- GOSH was established in 1852 and is now a world-leading paediatric hospital, with over 50 different clinical specialties, seeing more than 240,000 patients a year. The international arm of GOSH has seen more than 17,000 patients from over 90 countries in 2013/14, bringing UK expertise in managing highly complex paediatric conditions to children across the world, many of whom have no access to the level of specialist care required for these conditions in their own countries. They also engage in capacity building programmes to develop children's services internationally, including in Dubai and Kuwait.⁽⁸³⁾

Moorfields Eye Hospital

- Moorfields was opened in 1804 as the world's first hospital dedicated to the treatment of eye disease, and is now a world-leader in this field. It opened up a site in Dubai in 2007, and has since treated over 33,000 patients from over 90 countries, alongside training and education and ophthalmic research.⁽⁸⁴⁾ Moorfields also engages in a range of philanthropic partnerships to improve eye health in LMICs, including in Ghana and Palestine.

Royal Free Hospital

- The Royal Free Hospital was founded in 1828 and is one of the leading hospitals in the country, delivering world-class care particularly in the fields of transplant surgery, breast surgery, plastic surgery, myeloma, neuroendocrine tumours and containing the only high-level isolation unit for the treatment of infectious diseases in the UK, used extensively during the Ebola epidemic. The Royal Free International is part of the Trust, aiming to promote international collaborations and partnerships to share expertise in healthcare with and from different countries including Kuwait, Egypt, China and Pakistan. Specific programmes have included training specialist nurses from Hong Kong in infection control, intensive care and care of the elderly; and developing training programmes for clinical staff from Pakistan in liver transplantation and intensive care.⁽⁸⁵⁾

Leeds Cancer Centre

- Part of Leeds Teaching Hospitals NHS Trust, the Leeds Cancer Centre is an internationally recognised centre for cancer care. It also uses its expertise to improve cancer care outside the UK, developing partnerships with Jordan and Malta. In Malta it has provided a programme of training for medical physicists as well as supporting them to develop their cancer treatment services, and in Jordan it is sharing its expertise with the King Hussein Cancer Centre through training and research collaborations.⁽⁸⁶⁾

Healthcare UK is a joint initiative of the DH, UKTI and NHS England launched in 2013, tasked with promoting healthcare partnerships between the UK and overseas partners on a commercial basis. Whilst many of the commercial partnerships that NHS hospitals are engaged in have been developed independently, for example the GOSH, Moorfields Hospital and Royal Free Hospital programmes, others such as

the Leeds Cancer Centre-Jordan partnership have been facilitated by Healthcare UK. Whilst they do have a mandate for promoting the NHS and public sector actors abroad, the majority of Healthcare UK's work to date has been facilitating access for healthcare companies and so it is covered in more detail in Chapter 4.

Overseas partnerships and volunteering in LMICs

The fourth and final route through which the NHS contributes to improving health abroad is through institutional partnerships and volunteering by NHS professionals in LMICs. This activity has been supported by successive governments for over ten years, through the 'International Humanitarian and Health Work Toolkit to Support Good Practice' in 2003; commissioning 'Global health partnerships: the UK contribution to health in developing countries' ('The Crisp Report') in 2007; 'The Framework for NHS Involvement in International Development' in 2010; and endorsing the 'Academy Statement on Volunteering: Health Professional Volunteers and Global Health Development' in 2013. These publications have shown a commitment by all partners to enable NHS professionals to volunteer overseas and to break down barriers to volunteering.

Health partnerships in Wales

The Welsh Government has had a longstanding commitment to developing partnerships to improve health overseas and in Wales through learning from experiences from other countries. The Welsh Health Circular 'NHS Wales Health Links with Sub-Saharan Africa and other Developing Health Systems' encouraged Chief Executives of NHS organisations in Wales to ensure that they demonstrate their commitment to overseas links and supporting the MDGs.⁽⁸⁷⁾ This was followed up by the 2012 Welsh Government report: 'Health within and beyond Welsh borders: An enabling framework for international health engagement' which aimed to enable Wales to gain technologies and ideas from other countries and share their own experiences with different populations.⁽⁸⁸⁾

The 'Wales for Africa Health Links Network' brings together the expertise in the Welsh NHS with partners in Africa, building on the long history of these partnerships stretching back to 1987. As of 2013/14, there were 20 active health links involving 285 volunteers in Wales and over 1,200 volunteers in Africa. These reach over 2,000 beneficiaries directly and nearly three million indirectly across 11 countries in sub-Saharan Africa. NHS Wales has also set up the International Health Coordination Centre (IHCC) which currently includes 69 international projects active in 40 countries. Their 2014 report 'A Charter for International Health Partnerships in Wales' showcases their work and sets out their commitment to shared learning through health partnerships.⁽⁸⁹⁾

The scale and contribution of overseas volunteering to improving health in the UK and globally has been explored in detail in the report by the APPG on Global Health 'Improving Health at Home and Abroad: How overseas volunteering from the NHS benefits the UK and the world'.⁽⁹⁰⁾ This report found four primary areas of benefit from NHS staff volunteering abroad:

1. Improving health in LMICs: volunteers are able to strengthen capacity of health systems, institutions and professionals in these countries, where weaker training structures mean the chance to be supported by UK professionals is highly valued.
2. Leadership development: volunteers develop strong leadership skills and return with a greater understanding of how to enact change and communicate across professional cultures.
3. Sharing innovation: NHS staff are brought into direct contact with novel approaches to healthcare delivery, returning with greater confidence to challenge and change established practice in their Trust.
4. International relationships: a valuable asset to 'soft power' and international influence, giving Trusts a competitive advantage in recruitment and retention at home, and generating new opportunities for partnerships, research and revenue generation abroad.

The report also found that there was a diverse range of ways in which NHS professionals volunteered overseas. Whilst an increasing number of organisation-wide partnerships have been developed, a significant proportion of overseas volunteering, most likely the majority, is taken by staff outside these links through NGOs or their own connections in the host country. Some of these are long-term placements of 1-2 years or more whilst others are short-term of 1 month or less, with colleagues back in the UK also playing an important role by providing cover for those going abroad. The report also highlights how some 'overseas volunteering' is even being done through telemedicine, with Northumbria Healthcare NHS Foundation Trust delivering a training package in laparoscopic surgery to the Kilimanjaro Christian Medical Centre (KCMC) in Tanzania, then following this up with an audio-visual link between the two hospitals. This allowed the UK team to observe and advise their counterparts to support them to develop their skills to be able to operate independently.⁽⁹¹⁾

Despite this broad range of partnerships and the progress made to date, the AoMRC noted that challenges and barriers to volunteering persist.⁽⁹²⁾ These were categorised into six areas:

1. Getting time out of training and/or employment for volunteers
2. Formal recognition of volunteering for professional development
3. A fragmented environment for volunteering activities
4. Monitoring, evaluation and research of volunteering activities
5. Information, training and support for volunteers
6. Additional expenditures and the loss of employment for volunteers.

These barriers were also highlighted by interviewees as a real weakness for the UK, particularly: the lack of progress that has been made on approvals for taking time to go abroad; financial support; recognition of training; and the appraisals and revalidation processes. The GMC's restrictions on undertaking training abroad were noted to be a key example of a barrier that persists. Interviewees also reiterated the importance of volunteering abroad to providing quality care in the UK.

“ You're not only providing a philanthropic input into improving global health, but you're at the same time learning about these differences in cultures and religion that affect your daily professional lives in surgeries in the UK and ultimately benefit the patients regardless of where you are. ”

Whilst some partnerships still involve direct provision of services, increasingly they are directed towards health systems strengthening through building local capacity to deliver quality healthcare, ensuring that the benefits are sustained beyond the duration of the partnership. A major part of this shift has been the 'Health Partnerships Scheme' (HPS), funded by DFID and facilitated by the Tropical Health & Education Trust (THET), discussed below. Nonetheless, concerns about lack of long-term sustainability of many of these projects were raised by interviewees, highlighting that further action is required to ensure that the host countries truly benefit from these arrangements.

The role of NGOs in supporting volunteering and health partnerships

There are a broad range of UK and international NGOs that take doctors, nurses and other health professionals trained in the NHS to work overseas: on short placements and long placements, as salaried staff and unpaid volunteers, providing direct care and building up local capacity. These include Médecins Sans Frontières (MSF), the International Committee of the Red Cross (ICRC), Mercy Ships, Doctors of the World, International Medical Corps, Multi-Agency International Training and Support (MAITS), Merlin (now part of Save the Children) and many others. Capturing the full global footprint of British health professionals working through these NGOs to improve health is beyond the scope of this report, but is undoubtedly significant. This section focuses on three UK NGOs that work more directly with the NHS and Royal Colleges to support volunteering and partnerships: THET, Voluntary Service Overseas (VSO) and UK-Med.

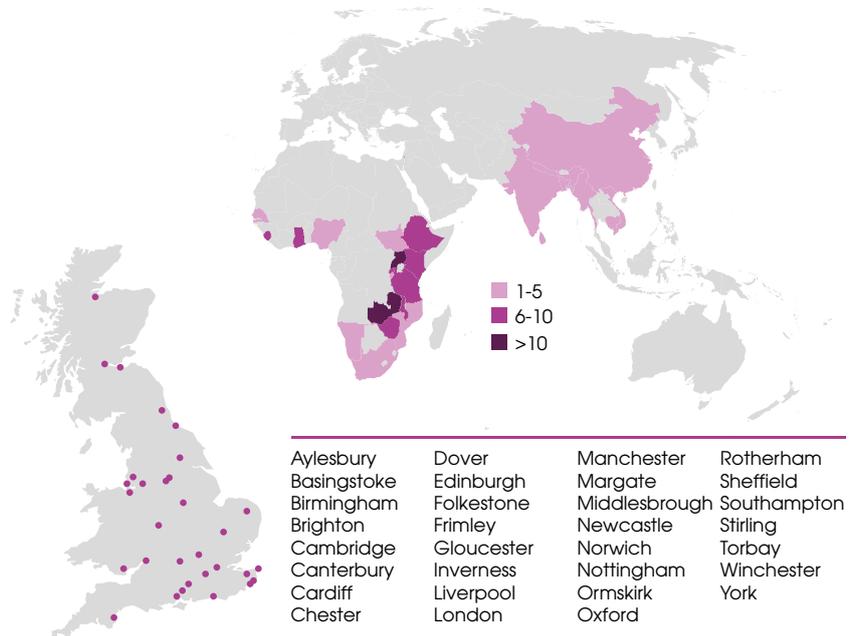
THET

THET is a specialist NGO that educates, trains and supports health workers through partnerships and strengthening health systems in LMICs. One of its major programmes is the 'Health Partnerships Scheme' (HPS) which is funded by a £30m grant from DFID, and which facilitates many of the links between NHS Hospitals, Royal Colleges, UK universities and their counterparts in LMICs.⁽⁹³⁾

The HPS programme provides support to develop partnerships so that they are more effective and likely to generate long-term results as well as grants through four funding streams that provide for a broad range of size, reach and theme. One example is grants for building local capacity to service and repair medical equipment, a major challenge in some countries where 50-80% of medical devices are out of service. What they all have in common is a focus on harnessing the expertise of NHS institutions and professionals, in partnership with their counterparts in host countries, to improve health outcomes through skills transfer and capacity development.

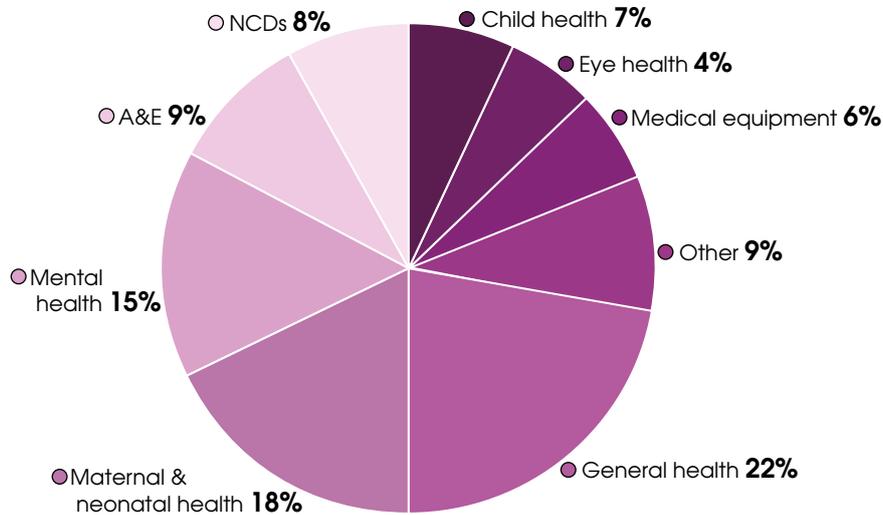
The HPS has supported over 85 partnership projects across 10 health specialties: maternal and newborn health, sexual and reproductive health, accident and emergency, HIV/AIDS, TB & malaria, child health, eye health, general health, mental health, NCDs and palliative care. Through these partnerships, over 1,000 NHS health workers have volunteered with projects in 26 countries in Africa and Asia, reaching 25,000 health workers with training and education.⁽⁹⁴⁾ These partnerships are between NHS hospitals, Royal Colleges and universities and their counterparts in LMICs. The geographic footprint of these partnerships is illustrated in Figure 8.

Figure 8: HPS partnerships by geography



Source: THET, Health Partnership Scheme Database, 2015

Figure 9: HPS projects by health sector



Source: THET, Health Partnership Scheme Database, 2015

Prior to the HPS programme, between 2009-2013 DFID and DH funded the International Health Links Funding Scheme (IHLFS), which was jointly managed by THET (as the lead partner) and the British Council. This provided for £1.25m per year in grants to support health partnerships in much the same way as the HPS. Through the IHLFS programme, over 100 grants were given across a range of health themes resulting in the training and education of 14,500 health workers in partner countries. The health themes and partner countries broadly mirror those of the HPS, and some of the IHLFS partnerships are now supported through the HPS.⁽⁹⁵⁾

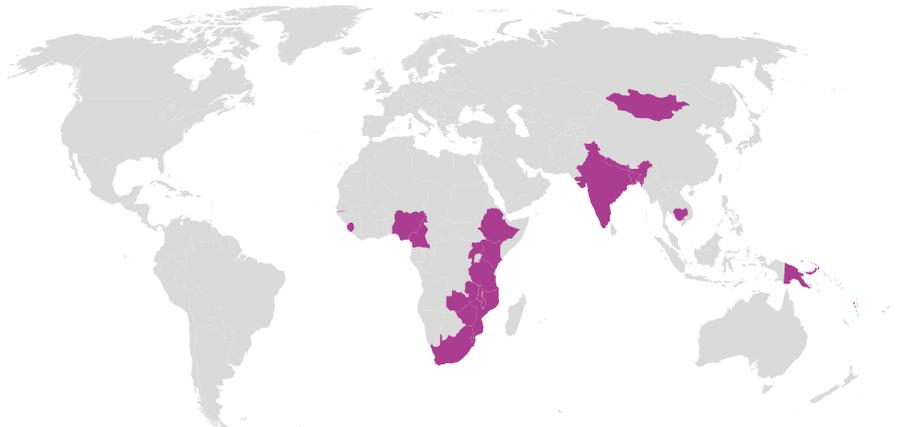
THET also has two major programmes in Somaliland and Zambia that NHS volunteers play an important role in. THET has been working in Somaliland since 2000 through King's Health Partnership (KHP), a collaboration with King's College London, and trained over 130 doctors, over 400 nursing graduates, 21 midwifery graduates and 39 community health workers (CHWs). They have also worked in partnership with local health institutions to improve governance, skills and resources so that they are better able to carry out their roles in the Somaliland health system.⁽⁹⁶⁾ In Zambia THET has been engaged in a similar programme of health systems strengthening since 2009, through supporting the training and education of health workers and building capacity at departmental, institutional and policy-making level.

VSO

VSO is a UK NGO that that recruits volunteers and supports them to work on a long-term basis with local partners (as opposed to running their own separate programmes). In addition to international volunteers, they also have an increasing emphasis on recruiting and working with local volunteers in the countries in which they work, particularly community health volunteers. The annual income and expenditure in 2013/14 was over £68m, with 32% of this coming from a strategic grant from DFID, and 77% in total coming from Government funding.⁽⁹⁷⁾

Health represents the second largest area of work for VSO at 20% of total expenditure, behind education with 23% of expenditure. In 2013/14 VSO worked with 189 partners in 22 countries, reaching over 1 million people with quality healthcare services (60% of these women) and providing high quality training to almost 40,000 doctors, nurses, midwives and other health professionals.⁽⁹⁷⁾ Many of the volunteers who contribute to these outcomes are NHS health professionals, including doctors, nurses, midwives, healthcare managers, laboratory staff and scientists, occupational therapists, physiotherapists, speech and language therapists and audiologists. Some of these volunteers will go through established programmes with VSO, e.g. through the RCGP/VSO partnership or the RCPCH/VSO partnership, and others will go through VSO directly as opportunities arise in the countries where they work.

Figure 10: Map of countries in which VSO works



Source: VSO Annual Report 2013/14

UK-Med

UK-Med is the UK NGO that coordinates the provision of UK health workers to international humanitarian crises, working together with DFID, DH and NGOs. It was established in 1995 to provide UK medical teams to support hospitals in Sarajevo during the war in the former Yugoslavia, and has since deployed teams to a large number of crises including in Cape Verde, Chile, China, Gaza, Haiti, Indonesia, Jordan, Kosovo, Pakistan, Philippines and most recently to the Ebola crisis in Sierra Leone and the earthquake in Nepal.⁽⁹⁸⁾

It hosts two registers of UK health professionals who are willing to deploy overseas in response humanitarian crises, currently funded by DFID: the UK International Emergency Trauma Register (UKIETR) and the UK International Emergency Medical Register (UKIEMR).

The UKIETR recruits surgeons, anaesthetists, emergency physicians and nurses and other supporting healthcare workers experienced in the management of trauma, providing appropriate training and preparation to allow them to deploy overseas during a major international catastrophe at 12-24 hours notice. 20 clinicians were deployed over five teams during the Gaza conflict, and 21 clinicians were deployed over three teams during Typhoon Haiyan in the Philippines, providing emergency care and trauma surgery. Health workers on the UKIETR have also undertaken four capacity building courses to improve resilience for mass casualty and trauma in Jordan and Iraq between 2013-14.⁽⁹⁸⁾

The UKIEMR likewise recruits and trains a broad range of health professionals to deploy to medical emergencies such as the Ebola epidemic in Sierra Leone, with over 150 deployed at the time of this report. Across both registers there are currently over 3,000 members, with over 1,600 of these applying specifically for the Ebola response programme. DFID has also committed to cover the costs of temporary staff to back-fill the positions of those that are deployed.⁽⁹⁹⁾

The particular strength of UK-Med and the development of the UKIETR and UKIEMR is that it addresses the issue of donors 'doing harm' in humanitarian disasters when medical teams of variable quality arrive in a disaster affected country, overwhelm local coordination structures, ignore guidelines and standards and have poor accountability to the host country. Through developing registers of 'quality assured', health professionals and working together with DFID, DH, NHS England, NGOs and host countries, UK-Med ensures that the teams are deployed in accordance to need, are well-coordinated, and deliver high-quality care that is in the best interests of the patient rather than what is easiest for the surgical team (for example limb reconstruction rather than amputation). The UKIETR was the first such register, and the WHO has established the Foreign Medical Teams Working Group (FMTWG) to roll out this concept worldwide. The coordinator of the UKIETR chairs the FMTWG, and the team works closely with other countries to set up similar registers, and with the WHO to facilitate the establishment of an international registration system.⁽¹⁰⁰⁾

DH sponsored agencies

Public Health England (PHE)

PHE is an executive agency of the DH sponsored agencies, tasked with providing national leadership and expert advice in public health, and is the second largest national public health organisation in the world. It was formed on 1st April 2013, incorporating 120 existing organisations, the largest of which was the internationally respected Health Protection Agency (HPA).

PHE had net expenditure of approximately £3.5bn in 2013/14, employing around 5,000 staff across England.⁽¹⁰¹⁾ It has a broad range of expertise including: national surveillance systems; management of outbreaks of infectious disease and chemical, environmental and radiation hazards; emergency response; specialist microbiology and vaccines; and immunisation and screening.

Health Protection Scotland, Public Health Wales and the Health Protection Agency Northern Ireland provide expert public health advice in their respective countries, working together to ensure good public health across the UK.

What is PHE's global footprint?

In 2014 PHE launched its global health strategy to provide a framework for its international engagement.⁽¹⁰²⁾ This excerpt from the foreword summarises the benefits to the UK and the rest of the world of taking a globally collaborative approach:

“ PHE believes that health is a global public good, and that we should use the skills and expertise at our disposal to contribute towards addressing the global health challenges that we face and to reducing global health inequities. In doing so we achieve our own domestic priorities, while contributing to the public health priorities of others. We will adopt the principle of co-development in our international activity, working in genuine partnership and recognising our shared learning and shared future. ”

PHE Global Health Strategy 2014-19

The strategy outlined five priority areas, building on its existing expertise and history of contributing to improving global health through its predecessor organisations such as the HPA. A key part of PHE's approach has involved working in partnership with governments, NGOs and global agencies to provide effective, coordinated assistance. These partners include the WHO, other UN bodies, the EU and European Commission, the European Centre for Disease Control (ECDC), the US Centers for Disease Control and Prevention (CDC) and other national public health agencies and the International Association of National Public Health Institutes (IANPHI). PHE's strategic priorities are listed below, together with examples of PHE's contribution in each area:

- 1. Improving global health security and meeting responsibilities under the International Health Regulations – focusing on antimicrobial resistance, mass gatherings, extreme events, climate change, bioterrorism, emergency response, new and emerging infections, cross-border threats and migrant health**

PHE is the national focal point for the WHO International Health Regulations, and is also the lead technical agency for the UK's contribution to global health security (GHS). GHS is a term used to describe the capacities required for countries to prepare for and respond to public health threats, and reduce the risk of these crossing borders.⁽¹⁰³⁾ These threats arise from the emergence and spread of new microbes, the globalisation of travel and trade, the rise of drug resistance and the intentional or accidental release of dangerous microbes from laboratories. Key events that have influenced the GHS agenda in the last 20 years include the 1995 sarin gas attack in the Tokyo subway, the SARS and swine flu (H1N1) pandemics in 2003 and 2009, and the current Ebola outbreak in West Africa. Following the Ebola outbreak the GHS agenda has emerged as one of the most important issues in health globally, requiring a cross-governmental response within the UK and for governments to work together globally to protect the health of populations across the world.

PHE is the lead technical agency for the UK's membership of the Global Health Security Initiative (GHSI) and the Global Health Security Agenda (GHSA). The GHSI is a ministerial-level international partnership launched in 2001 with the G7, Mexico, the EU and the WHO to provide a forum for cooperation and dialogue on GHS issues. This partnership made a valuable contribution to information sharing and collaboration during the H1N1 pandemic, improving the effectiveness of the global response.⁽¹⁰⁴⁾ The GHSA is a US-led initiative that brings together countries, international organisations and civil society to accelerate progress towards better GHS. The UK is one of the lead countries for 'antimicrobial resistance', and a contributing country for six other areas, making it the broadest contributor of the 39 countries that have committed to the initiative.⁽¹⁰⁵⁾ PHE also sits on the steering committee of the WHO Global Outbreak Alert and Response Network (GOARN), a collaboration of institutions and networks who pool resources to keep the international community constantly alert to the threat of outbreaks and ready to respond.⁽¹⁰⁶⁾

In recognition of its international expertise in public health, PHE also hosts a number of WHO Collaborating Centres to improve the global response to public health threats. The WHO notes that this allows them to 'gain access to top centres worldwide and the institutional capacity to ensure the scientific validity of global health work', and for the Centres themselves it 'opens up improved opportunities for them to exchange information and develop technical cooperation with other institutions'.⁽¹⁰⁷⁾ PHE hosts WHO Collaborating Centres for:

- Virus reference and research (special pathogens)
- Laboratory and diagnostic support
- Public health management of chemical incidents
- Prison and health
- Diphtheria and streptococcal infections
- Mass gatherings and global health security
- Reference and research on antimicrobial resistance and healthcare associated infections

PHE has also collaborated with the Kingdom of Saudi Arabia in the response to the emergence of MERS-CoV (Middle East respiratory syndrome coronavirus), and provided expertise and advice to countries on mass gatherings, including the 2010 World Cup in South Africa and the Hajj.⁽¹⁰⁸⁾

2. Responding to outbreaks of international concern, and supporting the public health response to humanitarian disasters

In addition to PHE's activities through GOARN and the global networks described above, public health emergencies and outbreaks that PHE has played a key role in include: the Ebola outbreak in Sierra Leone, the floods in Thailand and Pakistan, the Fukushima Daiichi nuclear disaster in Japan and typhoon Haiyan in the Philippines. During the Ebola outbreak, its support included both staffing laboratories to markedly increase the capacity to diagnose Ebola in the country, as well as providing technical advice and epidemiological support to the government, partners on the ground and the WHO. This is discussed further in the case study above. Interviewees highlighted that whilst the CDC had the most significant global footprint in this area, PHE also played a significant role.

“ PHE has built on the Health Protection Agency, for example on mass gatherings and humanitarian disaster risk management. The UK is now seen as playing an absolutely vital role in that global infrastructure. ”

3. Building public health capacity, particularly in LMICs

PHE has worked in collaboration with IANPHI to support the development of national public health institutes around the world, including in Kenya and Uganda.⁽¹⁰⁹⁾ It is also working to strengthen public health laboratory capacity in LMICs through a twinning arrangement, partnering PHE and other HICs to share expertise and knowledge, centred on the problem of AMR. Many LMICs have under-developed laboratory services, with limited capacity to diagnose and therefore treat people appropriately, or to monitor the spread of diseases. The initial focus is small, involving twinning PHE with the Seychelles, Sierra Leone and Trinidad and Tobago (through the Caribbean Public Health Association, CARPHA, and linking to other countries in the Caribbean), also involving Canada as a partner.

In India, PHE has formed partnerships with the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) to build capacity in public health and develop research collaborations; and with the Public Health Foundation of India (PHFI) to enable an exchange of scientific and technical information, skills and expertise. The initial reason for the joint initiative was for studying the epidemiology of Crimean-Congo Haemorrhagic Fever (CCHF), a disease with approximately 40% mortality in western India, with PHE having developed the only CCHF vaccine candidate to show complete protection in an animal model.⁽¹¹⁰⁾

4. Developing our focus on, and capacity for, engagement on international aspects of health and wellbeing, and non-communicable diseases (NCDs)

NCDs such as heart disease and cancer kill over 36m people each year, accounting for over 63% of global deaths, with almost three-quarters of these occurring in LMICs.⁽²⁵⁾ Accordingly, PHE has included developing their focus on this area for the future, though there is limited evidence of activity in this area to date.

5. Strengthening UK partnerships for global health activity

PHE works closely together with partners in the UK to increase the impact and effectiveness of its global health work, for example working closely with the DH on AMR and with Healthcare UK on looking at opportunities to strengthen public health capacity in emerging economies on a commercial basis. It is also strengthening its links with DFID to strengthen its role in improving public health in LMICs, and with other UK health actors across the state, not-for-profit and academic sectors. Interviewees identified these collaborations as key to strengthening the UK's role in health systems strengthening and combatting NCDs across the world.

National Institute of Health and Care Excellence (NICE)

NICE was set up in 1999 as an independent organisation to reduce variation in the availability and quality of NHS treatments and care across the country. In 2005 it extended its reach into public health, taking on issues such as smoking, obesity and exercise, and in 2013 it became a non-departmental public body sponsored by the DH and its role was extended to include social care.

Its primary roles are to provide:

- Evidence-based guidance and advice, including guidelines on the prevention and management of specific conditions and health technology appraisals (HTA) on the clinical and cost effectiveness of drugs and medical devices.
- Quality standards and performance metrics to drive quality improvement in health and social care.
- A range of information services such as the British National Formulary (BNF).

NICE's overarching approach combines a strong focus on scientific rigour (based on a close working relationship with research funders and universities) with careful attention to the process of decision making, including openness, transparency and inclusivity. In particular, NICE has placed a great emphasis on understanding social values and involving the public in developing guidance, working with professionals to understand what influences them to take up and use evidence, and taking local context into account. The result is an organisation that is widely recognised as a global leader in evidence-based decision making and efficient resource allocation.

“ NICE is the world leader in terms of a national initiative to actually define what should and shouldn't be funded within a healthcare system, so there's lots of international interest. ”

NICE had a net expenditure of £68.5m in 2013/14 and employed over 550 staff. During this period, they published 20 new clinical guidelines, 31 technology appraisals, and guidance on 34 interventional procedures. In addition to this they produced a range of quality standards, evidence updates and summaries, public health briefings for local government and the first piece of social care guidance.⁽¹¹²⁾

What is NICE's global footprint?

NICE guidelines are freely available on the internet and are routinely accessed by health professionals from across the world, raising the standard of clinical care. In addition to this, the BNF and its sister publication the BNF for Children (BNFC) are made available to over 100 LMICs for free through the WHO HINARI programme, and in 2013/14 NICE employees spoke at 130 conferences and events in the UK, Europe and beyond.⁽¹¹³⁾ In addition to this, NICE is a member of a number of global movements to improve the use of evidence-based medicine, including the Guidelines International Network (GIN), HTA International and the Appraisal of Guidelines Research and Evaluation (AGREE) initiative for guideline quality assessment. NICE also engages with key global actors to influence policymaking at the global level, for example the NICE Centre for Public Health Excellence supporting the work of the WHO Commission on the Social Determinants of Health.⁽¹¹⁴⁾

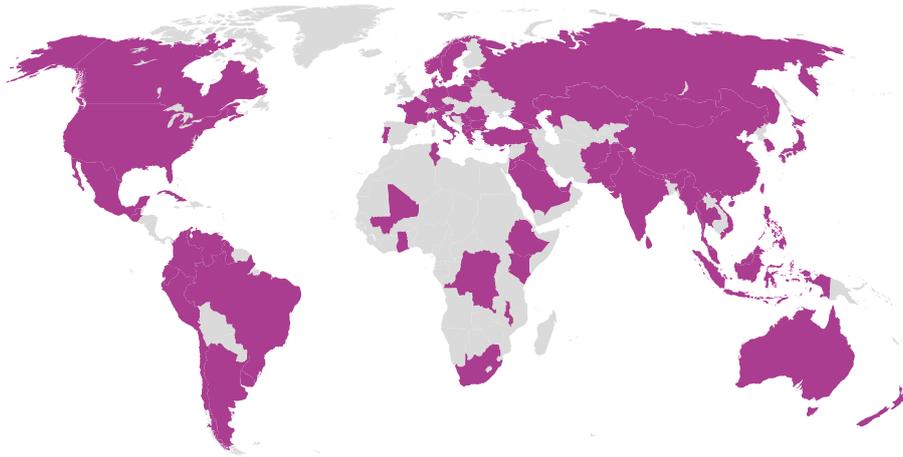
However, the most significant part of NICE's global footprint is through NICE International, established in 2008 in response to international demand for NICE's expertise and products. It operates on a non-profit, fee-for-service basis, obtaining funds from client countries; DH and DFID; multilateral actors such as the World Bank, WHO and UNFPA; and foundations such as the Commonwealth, Gates and Rockefeller Foundations. Its role is to use NICE's experience in the UK to offer other countries a range of support to make more efficient, effective and equitable use of resources including:

- Advice on using evidence to inform priority setting and policy
- Technical support on health technology assessment and guideline development and implementation
- Process advice to increase transparency, enhance public and stakeholder involvement and improve consultation

Recognising that health systems vary significantly between countries, NICE International supports countries to improve healthcare decision making within their own country context rather than exporting the exact model of NICE elsewhere. It also works to support South-South collaboration, e.g. through exploring the Cuban primary care and prevention focused model for strengthening health systems in Africa.

It has worked with policymakers and academics from over 75 countries illustrated in Figure 11, and delivered hands-on technical projects in over 35 countries. These projects have included supporting the creation of local NICE-like institutions such as the Institute for Health Technology in Colombia, and strengthening existing institutions such as in India and China through a HPS funded programme to provide advice on developing evidence-based guidance in LMICs.

Figure 11: Countries that NICE International has engaged with



Source: NICE International, 2015

The full list of projects is available on the NICE international website,⁽¹¹⁵⁾ but two major initiatives are:

- **The Methods for Economic Evaluation Project (MEEP):** a novel collaboration, funded by the Bill and Melinda Gates Foundation and led by NICE International, working together with partners from across the world. MEEP was the first attempt to standardise the way that economic analyses are carried out in LMICs. The result – the Gates ‘Reference Case’ – has had interest from a broad range of actors and has the potential to significantly improve decision making and make a substantial impact on healthcare provision in many LMICs⁽¹¹⁶⁾
- **The International Decision Support Initiative (iDSI):** an innovative partnership between NICE International and a broad range of partners, funded by DFID and the Gates and Rockefeller Foundations. The aim is to strengthen priority-setting institutions in LMICs as a means of improving resource allocation decisions, and ultimately the quality and efficiency of healthcare. Countries where the scheme has been working are Myanmar, Vietnam and the Philippines.⁽¹¹⁷⁾

Medicines and Healthcare Products Regulatory Agency (MHRA)

The MHRA is an executive agency of the DH, responsible for regulating medicines and medical devices in the UK. Through ensuring that medicines and medical devices are safe, high quality and effective, it plays a crucial role in protecting patients from harm, as well as supporting innovation through scientific research and development.

The MHRA has 3 different elements:

- The regulatory arm (MHRA), which regulates medicines, medical devices and blood components for transfusion. Medicines regulation is fully funded by fees charged to pharmaceutical companies, whereas medical devices regulation is almost entirely funded by DH
- The National Institute of Biological Standards and Control (NIBSC), a global leader in the standardisation and control of biological medicines such as vaccines. 60% of this is funded by fees charged for services, and 40% by the DH
- The Clinical Practice Research Datalink (CPRD), a data research service that aims to improve public health by using anonymised NHS clinical data, funded 50:50 with NIHR.

The MHRA employs over 1,200 people including a range of national and international experts, and operates as a government trading fund, funded mostly by income from its fees. Fee income in 2013/14 was £113m, with an additional £29m from DH and £9m from other sources. Expenditure was £122m, leading to an operating surplus of £28.7m.⁽¹¹⁸⁾ During the same time period it received and investigated 13,927 adverse incident reports, oversaw 889 Field Safety Corrective actions by manufacturers in the UK and issued 877 Medical Device Alerts, making a critical contribution to patient safety.

What is MHRA's global footprint?

MHRA is recognised both within Europe and globally as an authority in its field, and has particular strength in leading pan-European and international collaboration to improve drug and medical device safety across the world. The European Medicines Agency (EMA) is also located in London, further increasing the strength of the UK as a centre of global expertise in medical regulation. In addition to influencing UK, EU and international regulatory frameworks so that they are risk-proportionate and effective at protecting public health, the MHRA has global expertise and activity in the following areas:⁽¹¹⁸⁾

- **Licensing of new medicines:**

Within Europe, there are two routes to licensing medicines. The first is the 'centralised' route, where an application is made to the European Medicines Agency (EMA) and a lead agency is appointed based on objective criteria, designed to ensure the use of the best expertise in the relevant scientific area. The MHRA has consistently had the highest number of these 'rapporteur' appointments in Europe, reflecting its reputation as a leading expert body. The second route to licensing is the 'decentralised' route, where the company themselves choose the country they would like to lead the assessment. Again, the MHRA is the European leader, being chosen in 48% of all applications in which the UK was involved in 2013/14, reflecting its strong reputation in the commercial sector

- **Monitoring established medicines and devices**

The MHRA is coordinating a project to improve monitoring of drug safety monitoring (pharmacovigilance) across Europe: the Strengthening Collaboration for Operating Pharmacovigilance in Europe (SCOPE) project. This aims to bring together European regulators to engage in shared learning and support to improve the operation of their drug safety systems to improve patient safety, with the MHRA leading or supporting on each of the programme components.⁽¹¹⁹⁾ In addition to drug safety, the MHRA also leads efforts in pan-European collaboration on the regulation and vigilance of medical devices, leading task forces and co-chairing working groups in this area.

- **International supply chain inspection**

MHRA's reputation extends beyond Europe, with strong links to the major international regulators in other countries including USA, Japan, China and India. One of the major roles it plays internationally is inspection of premises involved in the pharmaceutical supply chain, and during 2013/14 the MHRA inspectorate carried out 140 overseas inspections, 34 of these on behalf of the EMA. Whenever a drug safety issue is encountered, the MHRA takes regulatory action whilst ensuring the continued availability of essential medicines and sharing information with international partners to ensure patient safety across the world. One of these issues in 2013/14 related to data integrity issues at certain Indian manufacturing sites, and the MHRA worked together with the WHO and US and Indian counterparts to train good manufacturing practice inspectors to ensure compliance with standards.

- **Enforcement action of illegal and dangerous medicines**

Another global role of the MHRA is in protecting the public from illegal and dangerous medicines through enforcement action. As part of the INTERPOL led Operation Pangea, it seized 3.7m doses of unlicensed medicines in the UK in one week alone in June 2013. It also participates in European and global collaborations to improve enforcement, including co-chairing WHO mechanism on substandard/spurious/falsely-labelled/falsified/counterfeit medical products (SSFFC) for the Euro region.

- **Setting standards**

The British Pharmacopoeia (BP) Commission Secretariat of the MHRA produces the BP, the definitive compendium of standards for the quality of medicines. The BP has been produced for 150 years, and plays an important role in the standards setting process for pharmaceuticals worldwide, used in over 100 countries, including being adopted as the national standard in Australia and Canada.

The NIBSC, which was a stand-alone body before merging with the MHRA in 2013, is responsible for developing and producing over 90% of the international standards in use around the world to assure the quality of biological medicines. Last year, the NIBSC tested and approved for release 1,497 batches of medicines, established eight new WHO international standards and developed a series of new CE marked standards. The work included materials to improve the potency measurement of important vaccines and drugs for cancers and inflammatory conditions and products to support diagnostic tests and proof of blood safety from hepatitis A and B.⁽¹¹⁸⁾

The NIBSC also continues to play a global role in developing, evaluating and quality assuring vaccine strains. Two major areas include the global response to influenza, as one of four Essential Regulatory Laboratories operating within the WHO Global Influenza Surveillance and Response Network, and to polio, through its contribution to the Global Polio Eradication Initiative (GPEI).

The MHRA also supports the commercial sector, e.g. through the UK Stem Cell Bank housed in the NIBSC. This is an international resource for stem cell research that works in collaboration with academia, industry and the MHRA Innovation Office, supporting companies and academics to navigate the regulatory process to bring innovative medicines to market.

Other state funded bodies with a global footprint

Two further state funded bodies with a more limited global footprint are the Health and Social Care Information Centre (HSCIC) and Health Education England (HEE).

HSCIC is the national provider of data, statistics and IT systems for the NHS and social care in the UK. Its expertise developed through its role in the NHS has led to it being accredited as a Collaborating Centre for the WHO Family of Classifications (WHO-FIC). This means that the UK is part of an international network of expert centres in global health classifications and coding development, including the International Classification of Diseases (ICD) codes used by all WHO member states to enable disease prevalence to be tracked nationally and compared internationally.⁽¹²⁰⁾

HEE provides national leadership on planning and developing the healthcare and public health workforce, including recruiting and promoting high quality education and training that is responsive to the changing needs of patients. The HEE International Office works closely with Healthcare UK to develop and deliver health workforce planning and training initiatives for the international market, on both a commercial and philanthropic basis. A pilot scheme to train up to 20 doctors from Saudi Arabia in the UK across the fields of ophthalmology, emergency medicine, cardiothoracic surgery and anaesthesia began in 2013, and HEE are currently looking into further partnerships.⁽¹²¹⁾ A key opportunity identified by interviewees was the role that HEE could play supporting health workforce training outside the UK to tackle the absolute shortage of health workers across the world.

Non-publicly funded health actors

Overview

The postgraduate training and regulation of health professions is the responsibility of a range of non-government actors, funded primarily by their members, and they have a critical role in ensuring the delivery of quality healthcare.

The contribution of these organisations to improving health globally is in two major areas. First, whilst their primary role is to support health professionals working in the NHS to deliver quality care in the UK, they also support them to take this expertise overseas to deliver care and build capacity across the world. Second, they use their expertise directly to improve health in other countries, through delivering postgraduate examinations, improving health systems in LMICs and engaging in global campaigns to improve health. There are three main categories: Royal Colleges, professional regulators and trade unions and professional bodies.

Royal Colleges

The medical Royal Colleges, Royal College of Nursing (RCN) and Royal College of Midwives (RCM) provide postgraduate education and training for doctors, nurses and midwives respectively. The RCN and RCM are also the trade unions for their profession. All of the medical Royal Colleges are brought together under the umbrella organisation the Academy of Medical Royal Colleges (AoMRC), whose membership is shown in the box below.

Membership of the Academy of Medical Royal Colleges

Royal College of Obstetricians and Gynaecologists	Royal College of Surgeons of England
Royal College of Emergency Medicine	Royal College of Physicians of Edinburgh
Faculty of Sexual and Reproductive Healthcare	Royal College of Surgeons of Ireland
Royal College of Anaesthetists	Royal College of Physicians of Ireland
Royal College of Paediatrics and Child Health	Faculty of Dental Surgery
Faculty of Intensive Care Medicine	Royal College of Physicians of London
Royal College of Psychiatrists	Royal College of Ophthalmologists
Royal College of Surgeons of Edinburgh	Faculty of Pharmaceutical Medicine
Royal College of Physicians and Surgeons of Glasgow	Royal College of Pathologists
	Faculty of Public Health
	Royal College of Radiologists

The Royal Colleges have a range of responsibilities including setting standards for postgraduate examinations, providing a programme of education and continuing professional development, developing and disseminating evidence-based guidance and audit and engaging in health policy debates. The size and international activity of each Royal College varies considerably but their expertise in each of these areas is increasingly being used to improve health around the world.

What is the global footprint of the Royal Colleges?

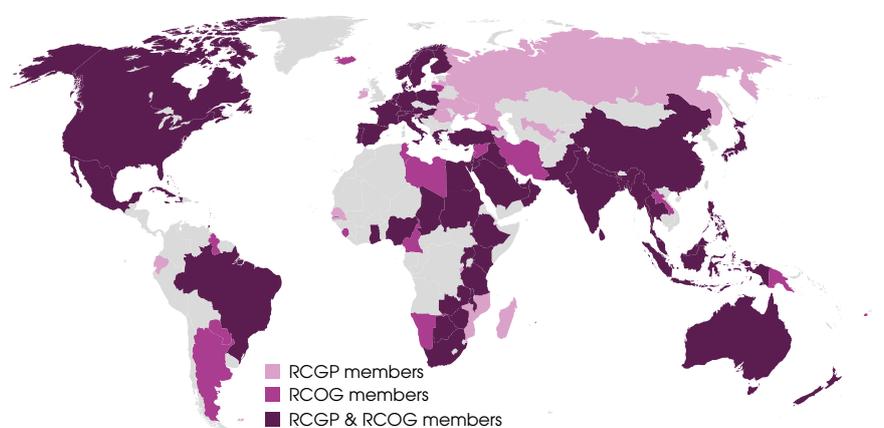
The Royal Colleges have a long history of working internationally to strengthen health systems and improve the quality of healthcare across the world – the RCGP for example has been active in the international arena for over 60 years. Some of the Royal Colleges have also recently developed international strategies that set out their activities and approaches to improving health globally. Examples of these include the RCGP ‘Transforming our approach to international affairs – a 10-year strategy’; the RCOG ‘Global Health Strategy 2013-17’; and the forthcoming FPH ‘Faculty Global Health Strategy 2015-19’. The AoMRC also has an ‘International Forum’ to promote co-ordination amongst members, including the medical Royal Colleges, the RCN and RCM, and other partners. However, interviewees noted that the Royal Colleges continue to work largely independently of one another with the International Forum playing a relatively minor role in coordinating international activity. This was raised as an area that needs to be improved, both between Royal Colleges and with other UK health actors.

“ I think we must collaborate more, I think the colleges must collaborate with each other and not work in silos, but we must work with DFID and NICE and all the organisations to form strong UK structures for delivering international work and health. I think that actually the next step is absolutely key. ”

There are a considerable number of members of each Royal College working outside the UK, delivering quality healthcare and learning and sharing skills and expertise. These include over 6,000 RCOG members, over 5,300 RCP members, over 5,000 RCS members, over 3,500 RCGP members, over 2,200 RCPsych members and many more across the remaining Royal Colleges. These include the full spectrum from those naturalised to these countries to those volunteering for a short period of time; from those who were trained and sat their exams in the UK to those who trained and sat these exams overseas.

The geographic footprint of these members spans over 100 countries, from high-income countries to low-income countries across six continents (and indeed the British Antarctic Survey). By way of illustration, the geographic footprint of RCGP and RCOG members is illustrated in Figure 12.

Figure 12: Geographic footprint of RCGP and RCOG members



Source: RCGP membership database and RCOG membership database, 2015

In addition to contributing to the provision of quality clinical care abroad through their members, there are six main ways in which the Royal Colleges contribute to improving health globally:

- Through their role in bringing doctors from LMICs to work and develop their skills in the NHS, e.g. sponsoring doctors for the MTI scheme as discussed above and through other programmes
- Through their role in supporting NHS professionals to volunteer and work abroad, e.g. THET and VSO partnerships as discussed above, as well as a range of other volunteering programmes
- Through developing curricula and delivering training and examinations across the world
- Through working with international partners and alliances
- Through advocacy on global health issues
- Through publication of internationally respected journals in their fields and sharing knowledge through hosting international conferences.

The first two of these have been covered earlier in this chapter, though many of the Royal Colleges have a significant number of other partnerships in countries across the world with the same goals and benefits of volunteering as discussed above. An overview of the other four areas is included here.

1. Developing curricula and delivering training and examinations across the world

Many Royal Colleges deliver their internationally recognised postgraduate examinations to doctors overseas, raising the standard of postgraduate medical education across the world. The MRCOG examination is sat by over 5,000 candidates each year, two-thirds of whom do so in one of 31 exam centres outside the UK. Likewise, the RCS provides examinations in 36 countries; the RCP in 27 countries; the RCPCH in 16 countries; and many other Royal Colleges in several locations outside the UK. These exams are viewed as the 'gold standard' in many of these countries.

Notably, the RCGP has developed a unique examination for doctors in other countries. The MRCGP(INT) exam is developed in partnership with examination boards in the respective countries and tailored to local needs, reflecting local disease patterns, cultural contexts and medical practices. The RCGP provides accreditation for these exams, establishing equivalence in standards and academic rigour with the UK MRCGP exam, though not allowing the holder to practice in the UK. There are currently seven different MRCGP(INT) examinations that have been accredited: Brunei, Dubai, Kuwait, Malta, Oman and South Asia (including Bangladesh, India, Pakistan and Sri Lanka). The delivery of this programme has led to over 1,100 international members working in 29 countries.⁽¹²²⁾

The Royal Colleges also provide a broad range of training courses to build capacity in other countries. The RCOG, for example, provides courses for low-resource settings including the essential gynaecological skills course and the essential obstetric skills and fistula course. Many RCOG members are also facilitators on the DFID 'Making it Happen' programme, aiming to train over 17,000 health workers to provide emergency care for mothers and newborns across Africa and Asia, saving more than 9,500 mothers' lives, nearly 10,400 newborn babies' lives, and preventing over 190,000 maternal disabilities from pregnancy and childbirth. The RCOG have also developed seven 'global health toolkits' to make improvements to education, training and standard setting in O&G in LMICs. Importantly one of these relates to assessing need in countries, ensuring that support is given according to the local need and not simply a rigid 'package' that is insensitive to differing local contexts.⁽¹²³⁾

Other Royal Colleges also deliver a range of training courses and provide support to develop curricula in other countries including the RCGP, the RCS and the RCPCH.

2. Working through international partners and alliances

Most of the Royal Colleges are members of the international alliances for their specialties, using their influence to promote good health and improve the quality of healthcare in the UK and globally. Examples of this include the RCGP's membership of the World Organisation of Family Doctors (WONCA), of which it was one of the original 18 members; the RCOG's membership of the International Federation of Gynaecology and Obstetrics (FIGO – whose Secretariat sits in London); RCN's membership of the European Federation of Nurses Associations (EFN); and RCM's membership of the International Confederation of Midwives (ICM). Besides these, there are many more international alliances and partners with whom the Royal Colleges work, ensuring that health professionals in the UK can share their expertise, as well as learning from others to constantly improve the quality of healthcare around the world.

3. Advocacy on global health issues

The Royal Colleges have a strong history of advocating for the health of the populations that they specialise in treating. Examples of this include the RCN advocating for nursing and human rights; the RCPCH advocating for improving access to immunisations; the RCOG advocating for women's health in the UK and globally, for example on maternal mortality, child marriage and female genital mutilation (FGM); and the RCPsych advocating for global mental health.

The Royal Colleges also highlight the importance of advocacy in their international strategies. The RCGP international strategy, for example focuses very much on advocacy for primary care, setting out their approach to working collaboratively to promote family medicine and primary healthcare (PHC) as a cornerstone for strengthening health systems. This builds on the original WHO Alma-Ata Declaration in 1978 advocating for the global use of PHC, the 2008 WHO Report 'Primary Health Care: now more than ever' and the subsequent calls from the WHA to strengthen PHC across the world.⁽¹²⁴⁾

4. Sharing knowledge through journals and conferences and publishing guidelines

Many of the Royal Colleges publish world-leading journals in their fields, spreading evidence and knowledge to improve clinical care around the world. Examples of these include the British Journal of General Practice (BJGP), British Journal of Obstetrics and Gynaecology (BJOG), British Journal of Psychiatry (BJPsych), Archives of Diseases in Childhood (ADC), RCM Midwives and others. The RCPsych is also promoting research in LMICs through the publication of BJPsych International, whose mission is to be a platform for authors from these countries. BJPsych International is also affiliated to the African Journal of Psychiatry and the Arab Journal of Psychiatry. Some of these journals are published through the BMJ group or the Nature group of journals discussed further in Chapter 3, others are published independently.

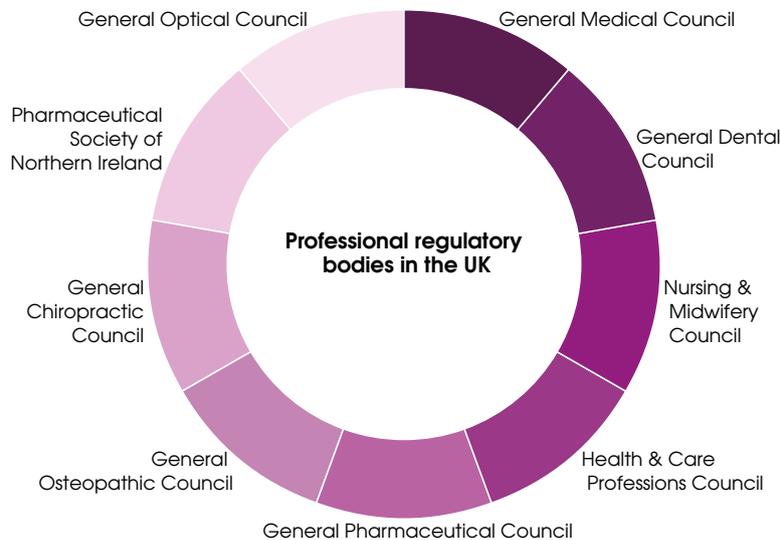
The Royal Colleges also facilitate the sharing of knowledge through hosting annual and specialist international conferences, sharing best practice with practitioners across the world and learning from others to improve practice in the UK. Conferences with a specific international theme from 2015 include the RCOG World Congress, the RCN Annual International Nursing Research Conference and the RCPsych International Congress, projected to have over 2,000 delegates from over 50 countries.⁽¹²⁵⁾

Finally, some Royal Colleges also produce and publish guidelines that are used by doctors around the world as 'best practice'. The strongest example of this is the internationally respected 'green-top guidelines' published by the RCOG on evidence-based clinical practice in obstetrics and gynaecology.

Professional Regulators

The main bodies for regulation of healthcare professionals in the UK are overseen by the Professional Standards Authority and are illustrated in Figure 13.

Figure 13: Professional regulatory bodies in the UK



The purpose of these organisations is to protect, promote and maintain the health and safety of the public by ensuring proper standards in the practice of health professions. Each is funded by its members, and manages a publicly accessible register of individuals who have met (and continue to meet) the requisite standard in a profession. If a healthcare professional is found to be putting patient safety at risk, then the professional regulator will take action which may result in them being removed from the list, with practicing whilst not on the register constituting a legal offence. This system ensures that patients can trust those in charge of their care, and that health professionals remain up-to-date with developments and qualified to practice throughout their careers.

The global footprint of the GMC and the Nursing and Midwifery Council (NMC) are discussed here. The GMC is the statutory regulator of doctors, maintaining a register of over 270,000 doctors, overseeing standards for 40,000 undergraduates and 50,000 postgraduate doctors in training and handling over 28,000 complaints about registered doctors between 2010-13.⁽¹²⁶⁾ The NMC is the statutory regulator for nurses and midwives, maintaining a register of over 680,000 nurses and midwives and quality assuring 79 educational institutions to deliver over 900 education and training programmes.⁽¹²⁷⁾

What is the global footprint of professional regulators?

The UK model of professional regulation is highly respected, and the GMC in particular uses its influence to improve medical regulation across the world. It has hosted over 100 visits from overseas regulators looking to learn from its approach since 2011. It is also a founding member of the International Association of Medical Regulatory Authorities (IAMRA) whose purpose is to encourage best practice among medical regulatory authorities worldwide, and it hosted the 11th International Conference on Medical Regulation in London in September 2014. It also influences European policy through its membership of the European Network of Medical Competent Authorities (ENMCA), Health Professionals Crossing Borders (HPCB) and the Alliance of UK Healthcare Regulators in Europe (AURE).

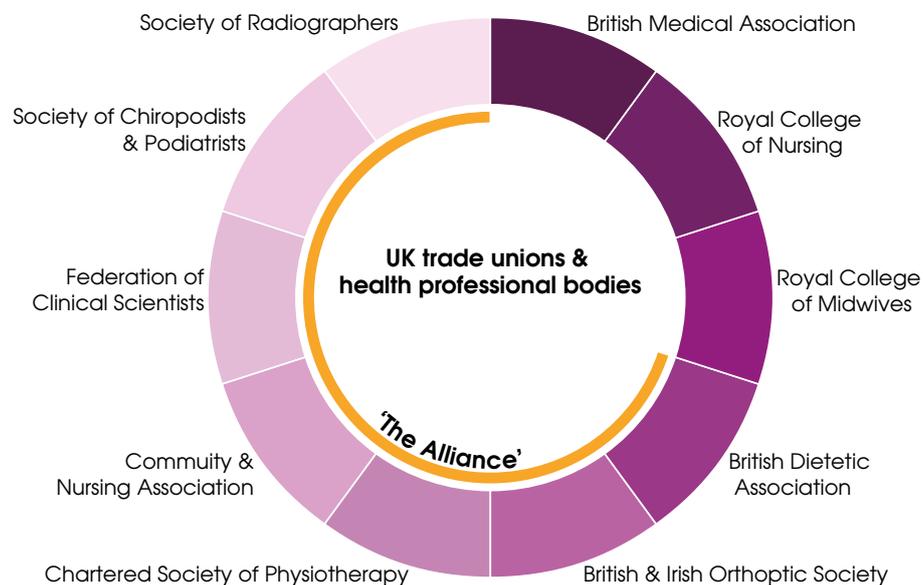
A recent overseas role for the GMC has been quality assuring UK medical schools with campuses overseas, including the Newcastle University Medical School campus in Malaysia, the St George's University of London Medical School campuses in Cyprus, Israel and the USA, and the University of Southampton Medical School campus in Germany. This quality assurance process assures that these campuses meet the same standards and outcomes as UK programmes, and could be extended to non-UK medical schools to raise the standard of medical education across the world.

The NMC likewise has an EU and International team that focus on influencing international developments in healthcare regulation and working collaboratively with EU and international stakeholders. It is a member of the Network of European Midwifery Regulators (NEMIR), lobbying for improvements in EU legislation regarding the training of midwives, as well as HPCB and AURE alongside the GMC. The NMC is also strengthening its work in engaging with European patient organisations to ensure that their views are heard and reflected in their work.

Trade Unions and Professional Bodies

As described above, the RCN and RCM are the trade unions for the nursing and midwifery professions in the UK. The British Medical Association (BMA) is the trade union for doctors, and works on global health issues as well as supporting UK doctors to work overseas. The main unions for the other healthcare professions come under 'The Alliance', and many of these also act as the professional bodies for those fields. These are illustrated in Figure 14.

Figure 14: Trade unions and health professional bodies in the UK



What is the global footprint of trade unions

These institutions contribute to improving health globally through four major routes: supporting UK professionals to work overseas; engaging with European and international bodies; global health campaigns; and through international conferences and journals.

1. Supporting members to work overseas

Many of these organisations provide support to their members looking to work or volunteer overseas, facilitating the links described earlier. The BMA provides support for doctors looking to work in other high-income countries such as New Zealand, Australia, USA, Canada and Europe, as well as doctors looking to volunteer in LMICs. Likewise, there are over 1,000 UK physiotherapists currently working and volunteering abroad, and the Chartered Society of Physiotherapy (CSP) supports its members to plan their time abroad and manage their return to the UK.⁽¹²⁸⁾

2. Engaging with European and international bodies

These organisations also engage in international collaborations to improve the quality of healthcare across the world. The BMA has been active in European affairs for over 30 years and has a Brussels office that leads on links with European institutions and enhancing the BMA's impact and lobbying at European level. BMA's membership of international professional associations allow it to increase its effectiveness, present a consensus voice of doctors in important issues, and influence the quality of standards, training and patient care across the world. These include the World Medical Association (WMA) and Commonwealth Medical Association (CMA) as well as a range of European bodies.⁽¹²⁹⁾

The British Dietetic Association (BDA) is a leading dietetic association in Europe and a major contributor to dietetic practice across the world. They have worked closely with their counterparts including in the USA, Canada, Australia, Malaysia and Uganda, and contribute to improving the quality of dietetics globally through their membership of the European Federation of the Association of Dieticians (EFAD) and the International Confederation of Dietetic Associations (ICAD). As an international partner of the Practice-based Evidence in Nutrition (PEN), together with Australia and Canada, the BDA is also contributing to a global resource for evidence-based nutrition practice.⁽¹³⁰⁾

Similarly, the CSP is a founder member of the World Confederation for Physical Therapy (WCPT), and the British and Irish Orthoptic Society is a member of the International Orthoptic Association (IOA), both encouraging high standards of research, education and practice in their fields through collaboration and shared learning.

3. Engaging in global health campaigns

The BMA engages directly in global health campaigns including climate change, human rights and ending water poverty to advocate for change that will improve lives across the world. They have advocated for improved working conditions and labour rights in Pakistan where many of the surgical instruments used in the NHS are made. As a result of this lobbying, workers in healthcare supply chains will be protected under powers set out in the Modern Slavery Act 2015.⁽¹³¹⁾ The BMA also provides funding for the Healthcare Information for All (HIFA) initiative to improve access to informed healthcare providers (see Chapter 5), and runs an 'Information Fund' in association with the NGO Teaching-aids At Low Cost (TALC). This provides health information and educational materials to health-focused organisations in LMICs including Sierra Leone, Uganda, DR Congo and Pakistan.

4. International conferences and journals

Finally, these bodies host and attend international conferences and publish international journals, sharing best practice from the UK to improve health abroad, and learning from others to improve health in the UK. Whilst the major journal in terms of reach is the BMJ, the official journal of the BMA, other examples include the Journal of Human Nutrition and Dietetics (BDA) and Physiotherapy (CSP).

DFID and overseas aid

The UK's role as a donor

The UK is the second largest donor in the world behind the USA, spending £11.8bn in 2014. In 2013 it became the first and only G7 country to reach the longstanding UN target of 0.7% of gross national income (GNI) in overseas development assistance (ODA), and in 2015 the first country to enshrine this target into law. This has been praised widely and noted by interviewees to have made a major contribution to strengthening the UK's reputation internationally and increasing its influence. The UK's global position in ODA is illustrated in Figure 15 and Figure 16a-b.⁽¹³²⁾

Figure 15: ODA in 2014 for the top 10 donors in the world

Rank	Country	ODA US\$bn (2014)	ODA/GNI % (2014)
1	US	32.73	0.19
2	UK	19.39	0.71
3	Germany	16.25	0.41
4	France	10.37	0.36
5	Japan	9.19	0.19
6	Sweden	6.22	1.10
7	Netherlands	5.57	0.64
8	Norway	5.02	0.99
9	Australia	4.20	0.27
10	Canada	4.20	0.24
Total for G7 countries		95.461	0.27
Total for OECD-DAC		135.164	0.29

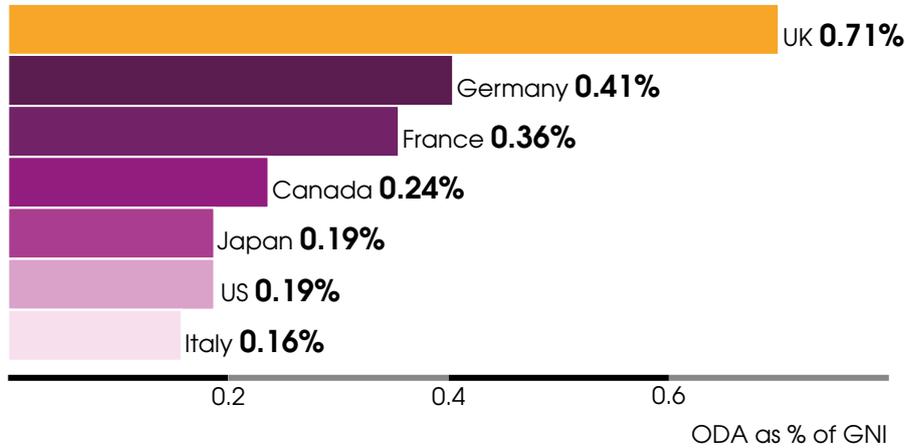
Source: OECD, Net Official Development Assistance from Development Assistance Committee (DAC) and other donors in 2014

Figure 16a: Contributions to total G7 ODA in 2014



Source: OECD, Net Official Development Assistance from Development Assistance Committee (DAC) and other donors in 2014

Figure 16b: ODA as % of GNI in the G7 in 2014



Source: OECD, Net Official Development Assistance from Development Assistance Committee (DAC) and other donors in 2014

The existence of DFID as a stand-alone cabinet level department is a clear sign of the UK's commitment to improving the lives of people in the poorest countries around the world, and the UK is the top ranked G7 country in the Commitment to Development Index (CDI) 2014 as shown in Figure 17, with only Denmark, Sweden and Finland ranking higher globally. The CDI measures how well wealthy governments are living up to their potential to help poor countries.⁽¹³³⁾

Figure 17: Commitment to Development Index 2014 rankings for G7 countries

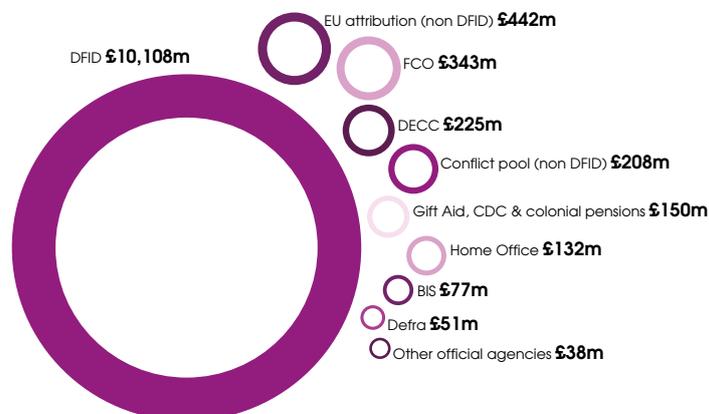
G7 rank	Overall rank	Country
1	4	UK
2	9	France
3=	12=	Germany
3=	12=	Canada
5	17	Italy
6	19	US
7	26	Japan

Source: Commitment to Development Index 2014

The UK has also taken a leading role in shaping the global health and development agenda.⁽¹³⁴⁾ Two examples of this are the Prime Minister co-chairing the UN High-Level Panel on the post-2015 agenda, and the Secretary of State for International Development co-chairing the Global Partnership for Effective Development Co-operation. Both of these are key global policy areas that will contribute to healthier populations across the world.

As noted at the beginning of this chapter, most Government departments have a role to play in improving global health, and some of the ODA funding channelled through these departments will contribute to this. However, as the largest department with regard to overseas aid, and the only department that disaggregates its data for health, we focus here on DFID. The division of UK ODA is illustrated in Figure 18.⁽¹³⁵⁾

Figure 18: Amount of UK ODA in 2014 channelled through each department



Source: DFID, Statistical Release: Provisional UK Official Development Assistance as a proportion of Gross National Income, 2014

DFID's role and reputation

DFID leads the UK's work to end extreme poverty and was responsible for almost 86% of the total ODA in 2014. It employs 2,700 staff across the world, many of whom are technical experts in development, including health and humanitarian advisers. It is important to note that as a donor DFID implements its programmes through partner NGOs and institutions, and therefore DFID funding supports the employment and deployment of a much larger number of people, both from the UK and in other countries.

DFID has a strong reputation amongst other donors, UN and other multilateral organisations, NGOs and most importantly the countries in which it works. This stems both from the expertise of its staff, and also its commitment to effective development. Examples of this include:

1. **Support for country ownership:** This includes DFID's work in strengthening government systems and through DFID's longstanding commitment to untied aid. Tied aid is the practice of offering aid on the condition that it is used to procure goods and services from a specific country or region, usually the donor country itself. Untying aid was recommended by the OECD in 2001 and the Paris, Accra and Busan High Level Fora on Aid Effectiveness in 2005, 2008 and 2011 respectively. This has the dual benefits of being more efficient, with the procurement costs of tied aid over 15-30% higher than untied aid, and strengthening country ownership.⁽¹³⁶⁾ 100% of DFID's aid has been untied since 2001, and it has taken a leading role in pushing other donors to untie aid and increase their commitment to aid effectiveness.
2. **Commitment to transparency:** DFID was the first organisation to publish to the International Aid Transparency Initiative (IATI) standard in 2011 and is widely recognised as a global leader in transparency. It was rated as the most transparent out of 39 donors by the Global Partnership for Effective Development Cooperation (GPEDC) in 2014, and 2nd out of 68 donors by the Aid Transparency Index (ATI) 2014.^(137, 138)

3. **Commitment to partnership working:** DFID is noted for its commitment to partnership working in health and development, from multilateral agencies such as UN bodies, to civil society partners and the private sector, to other donors and emerging powers such as China, India and Brazil to encourage south-south cooperation and knowledge sharing. In 2013-14 DFID was the largest funder of multilateral agencies in the world, and 16% of its bilateral programme was carried out by civil society organisations (CSOs).^(139, 140) In addition to working in partnership with multilaterals, it also takes a leading role in their development, from WHO and World Bank reform to investing in the Global Funds.

“ The UK has been a seminal partner in setting up, supporting and investing in global health partnerships such as GAVI, such as the Global Fund. They’ve always been one of the first to the table and they’ve been some of the biggest funders. ”

DFID also made a strong contribution to improving the coordination of partnership working through taking a lead role in launching the International Health Partnership+ (IHP+) in London in 2007. This aimed to mobilise national governments, development agencies, civil society and others to support single, country-led national health strategies and to hold each other to account. It currently has 29 donor and development agency partners and 36 developing country partners⁽¹⁴¹⁾ However, it has been noted that DFID’s commitment to the IHP+ is lower than it has been in the past, and this is an area where it should refocus its attention.⁽¹⁴²⁾

4. **Evidence based policy-making:** Interviewees noted this to be a particular strength of DFID vis-à-vis other actors in development – arising from a combination of strong processes for ensuring that evidence is central to the policy making process, the high number of technical experts working in the organisation and the strong links to academic bodies and researchers.

“ (decision-making) in general in international development and health is much better in the UK. We see that it’s underpinned by science, evidence, modelling, and so on which I’ve never seen anywhere else. ”

More broadly, the peer-review by the OECD-DAC in 2014 was largely positive, particularly in relation to the UK’s leadership in global health and development:⁽¹³⁴⁾

“ An active member of the international community, the UK continues to lead in shaping the global development agenda. It uses its position strategically to address global public risks and brings development concerns into international fora. Particularly valued is its leadership in setting the post-2015 development agenda, including work to promote greater transparency, fairer trade and tax systems, and protection of women and girls, as well as minority rights. ”

OECD Development Co-operation Peer Reviews: United Kingdom, 2014

However, the report did note that within government there was a “lack of a comprehensive approach to ensuring its development efforts are not undermined by other government policies”. This builds on the earlier discussion of the benefits of refreshing the cross-governmental global health strategy to ensure better coordination of government activities to improve health globally.

The International Development Committee (IDC) of the House of Commons published its report into DFID’s work in Health Systems Strengthening in 2014.⁽¹⁴²⁾ It noted that DFID has an excellent reputation in health systems strengthening (HSS), and its own work in this area is world-leading. However, it recommended that DFID should build on this expertise to show global leadership and influence the agendas of other donors and partners. This was particularly the case in the context of its increasing funding to multilateral organisations and the focus on universal health coverage (UHC) in the Post-2015 Development Agenda. It also highlighted that the UK has one of the best health systems in the world, but DFID makes only limited use of it. The report recommended that DFID builds on its work with NICE International and others to maximise this potential, a view which was echoed by almost all those interviewed for this report.

Finally, the major threat highlighted to DFID’s reputation was the combination of a rising ODA budget with the reduction in the number of civil servants to manage that budget:

“ Every government department has a continuing reduction in the number of civil servants. DFID’s budget, goes up every year because GDP grows and the number of staff goes down every year. That doesn’t make any sense whatsoever. That, I think, is a problem for quality. ”

How DFID works to improve health

DFID provides aid to 28 priority countries through its bilateral spending, and to the rest of the world through multilateral organisations such as the WHO, UNICEF and the World Bank. In 2013-14, the DFID spent 56% of its ODA bilaterally, and 44% through core funding to multilaterals. It is also a major donor of humanitarian assistance, spending £891m or 16% of the bilateral budget in 2013-14 on humanitarian emergencies, a third of this on the Syria crisis. In total, the UK has committed £800m to the humanitarian crisis in Syria and the surrounding region, providing over 1.3 million medical consultations, over 8.7 million food rations, and over 1.5 million people with access to clean water.⁽¹⁴³⁾

This section will map DFID’s contribution to improving health globally through its bilateral spend, its multilateral spend and its role in moving the global health agenda forwards. DFID is also one of the top funders of international health research in the world, and a major funder of UK NGOs. These include funding to THET, VSO and UK-Med as discussed above. Accordingly, a significant proportion of the contribution of the UK academic and not-for-profit sectors to improving health in LMICs is funded by DFID, and this is discussed further in Chapters 3 and 5.

How is what to include in 'health' ODA decided?

ODA flows are coded according to internationally agreed criteria set by the OECD DAC Statistical Reporting Directives. This allows for international comparisons in aid spending, despite differences in how each country may categorise their spending internally.⁽¹⁴⁴⁾ So whilst 'health' spending includes health services, malaria and TB, health workforce development and even basic nutrition, it does not include many other areas that contribute to health. The coding system also distinguishes between 'health' and 'population and reproductive health', with the latter including reproductive healthcare and HIV/AIDS.

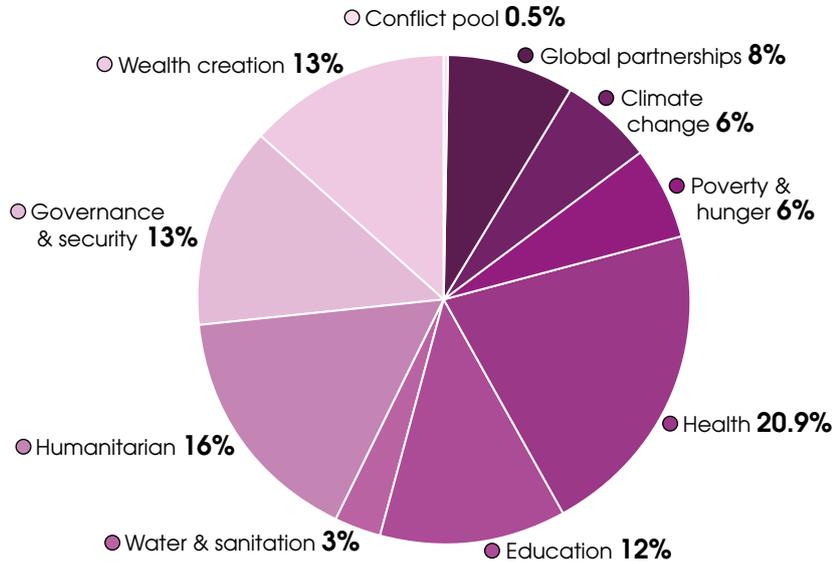
The most obvious additional sector that makes an important contribution to improving health is water and sanitation, with a lack of access to clean water and sanitation responsible for approximately 2.4m deaths per year and 7% of the total burden of disease.⁽¹⁴⁵⁾ Humanitarian assistance and climate change programmes also play an important role in health worldwide. Beyond this, through a social determinants of health lens all development assistance can be viewed as contributing to better health, from human rights and gender equality, to education (particularly for girls), to economic growth and better prospects for employment.

As a major donor, DFID classifies its activity according to these criteria. Where possible, 'health' and 'population and reproductive health' are condensed into one category, and the main health outcomes of 'non-health' sectors are also included.

How DFID works bilaterally to improve health in LMICs

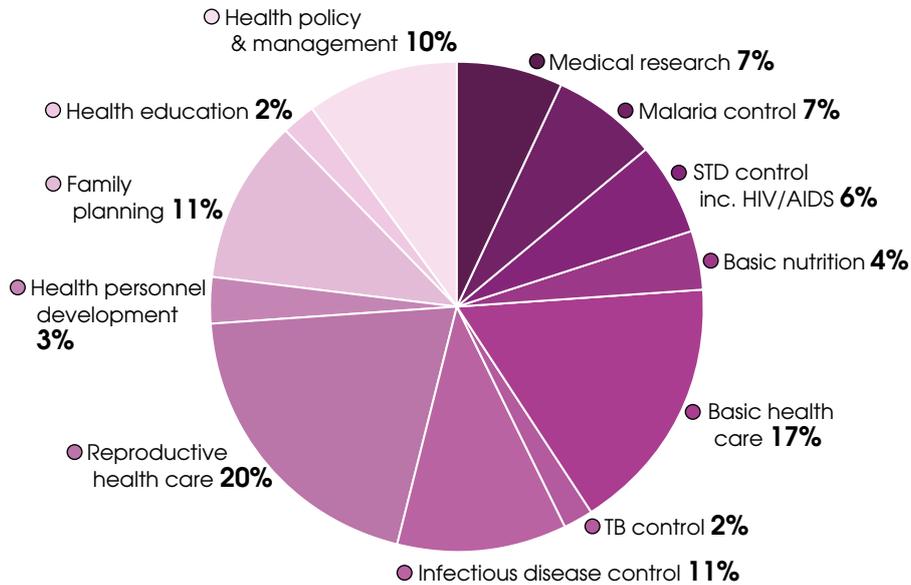
Health is a major focus of DFID's work across the world, with expenditure on health rising sharply between 2009 and 2013 to become the top area of spending at over £900m per year. Figure 19 shows that the other large programme sectors include humanitarian action (which also makes a major contribution to improving health), governance and security, wealth creation and education. Figure 20 shows the largest single area of health spend was reproductive healthcare, followed by basic healthcare, family planning, infectious disease control and health policy and management.⁽¹⁴⁶⁾

Figure 19: DFID's bilateral spend by sector



Source: DFID Annual Report and Accounts 2013/14

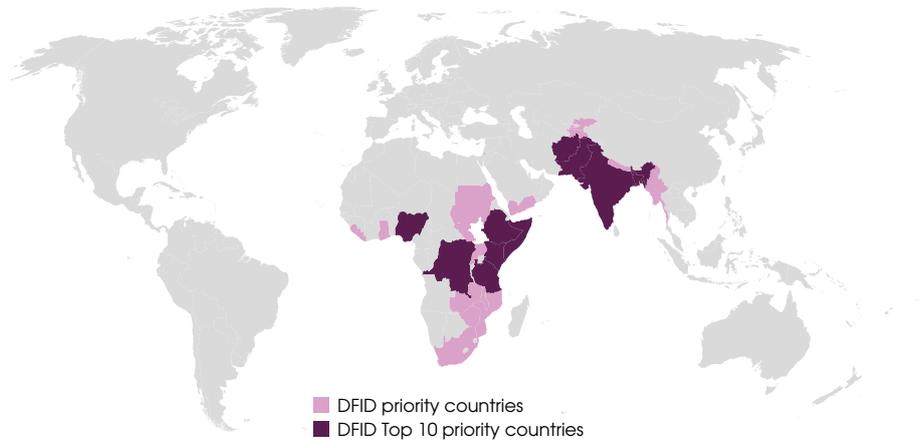
Figure 20: Proportion of overall health expenditure on each sub-sector



Source: DFID Annual Report and Accounts 2013/14

DFID conducted a comprehensive 'Bilateral Aid Review' (BAR) of its direct funding to countries in 2011, looking to focus aid in fewer countries where it could have greater impact. Following this review, DFID is focusing its programmes in 28 countries illustrated in Figure 21, in addition to three regional programmes covering Africa, Asia and the Caribbean.⁽¹⁴⁷⁾

Figure 21: DFID priority countries



Source: DFID Annual Report and Accounts 2013/14

Overall, in 2014 60.1% of DFID’s bilateral spend was in Africa, 38.8% in Asia, and the remaining 1.1% in the rest of the world (Americas, Pacific and Europe).⁽¹⁴⁰⁾ This approach was noted to represent a trade-off. On the one hand, better targeting of aid should lead to better results, but on the other hand there is an increasing global coverage gap. It was noted that the UK influence in health more generally ‘covers the two extremes’ of high-income countries through commercial partnerships and low-income countries in sub-Saharan Africa and South Asia through DFID, but this leaves a large number of countries where the UK has no influence. In addition to the missed opportunity of the contribution that UK expertise can make to improving health in these countries, one respondent noted that this represents an additional challenge from a domestic perspective:

“ This is a major gap, and actually quite worrying from a UK domestic perspective ... the Ebola outbreak was in Sierra Leone where we’ve had a major presence for over a decade, where we understand the system, have strong relationships – these allowed us to respond effectively – if the next outbreak is in Kazakhstan, or Laos, then it will be very different because we only have a very small FCO presence in these places, and they have no health remit or expertise. ”

The top five countries by expenditure that DFID is working with in 2015 are Pakistan, Nigeria, Afghanistan, Tanzania and Ethiopia.⁽¹⁴⁸⁾ The top recipients of DFID have varied slightly over the years to reflect changing priorities and areas of need as shown in Figure 22, in particular the reduction in aid to India as the bilateral programme is wound down.

Figure 22: Top 5 recipients of DFID ODA between 2009-2015

2009		2012		2015	
Rank	Country	Rank	Country	Rank	Country
1	India	1	Ethiopia	1	Pakistan
2	Ethiopia	2	Pakistan	2	Nigeria
3	Bangladesh	3	India	3	Afghanistan
4	Sudan	4	Nigeria	4	Tanzania
5	Tanzania	5	Bangladesh	5	Ethiopia

Source: DFID Annual Report and Accounts 2009/10; 2012/13; and Development Tracker, 2015

In 20 out of the 28 countries where DFID is focused, health is either the top area of expenditure or the 2nd top (usually after governance). The remaining countries are largely fragile and conflict-affected states where a much larger proportion of the expenditure is on governance and disaster relief.

DFID's approach to health combines investments that achieve targeted results with investments in health systems strengthening (HSS). With hundreds of millions of pounds spent across a broad range of countries, a full description of all of DFID's activity in improving health through its bilateral programmes is beyond the scope of this report. Additionally, all information on active programmes is publicly available through the Development Tracker website, and on research through the Research for Development website as part of DFID's commitment to transparency.^(148, 149) Key achievements in the two years to 2013/14 are included here to illustrate the impact of DFID's work.⁽¹⁴⁰⁾

- DFID has reached 19.3 million children under 5 and pregnant women through nutrition-relevant programmes, combating stunting, wasting and improving maternal and child health.
- DFID has supported 14.8 million people to have sustainable access to clean drinking water, 14.5 million people to have sustainable access to improved sanitation, and 29.4 million people to have access to improved hygiene. Sustained use of clean water and hygienic latrines is effective in reducing diarrhoea and could prevent almost 1.4 million unnecessary child deaths every year.
- DFID health programmes have led to:
 - 36,000 maternal lives saved
 - 64,000 newborn lives saved
 - 33.7 million long-lasting insecticide-treated bed-nets distributed, and a considerable contribution to the reduction in malaria related deaths
 - 3.6 million births attended by a skilled birth attendant
 - 5 million additional women using modern methods of family planning

Though DFID is transitioning away from providing aid to middle-income countries such as India and China, it does continue provide technical assistance to strengthen health systems in these countries. With approximately 75% of the world's poor living in middle-income countries, this continuation of this strategy was viewed as a critical component of ensuring access to healthcare for the poorest. However, some interviewees expressed concern that this technical assistance was too limited in scope and scale, and that these countries could benefit from much stronger support from DFID in strengthening their health systems if they are to reach the goal of UHC.

DFID also engages with emerging powers through the 'Global Development Partnerships Programmes' (GDPP) with Brazil, India, China, South Africa and the Gulf. These partnerships aim to combine expertise and experience to tackle global health and development challenges that affect the world's poor, in particular through encouraging South-South collaboration. Examples include DFID's partnership with Brazil on tackling the global challenge of undernutrition; DFID's partnership with India, enabling the scaling up of work with Indian generic pharmaceutical manufacturers to lower the cost of life-saving medicines across the developing world, saving £1bn on essential drugs and vaccines; and sharing India's model of health financing and South Africa's expertise on health systems planning with other African countries. DFID's partnership with China is described further below.

The UK-China Global Development Partnership

DFID closed its bilateral aid programme to China in 2011, and now works together with China to identify how to combine the strengths and expertise of both partners to improve health and development globally. DFID is the first development agency in the world to work with China in this way, pioneering this approach to North-South collaborative working and supporting South-South learning and knowledge sharing.

China is home to almost 20% of the world's population, 70% of those lifted out of poverty between 1985 and 2010, and is the largest and fastest growing emerging economy in the world. It is also a major investor in low-income countries, particularly in Africa, and an increasingly important player in global policy-making. Furthermore, it is the world's second largest investor in R&D, with an unparalleled capacity for delivering low cost solutions to development challenges. It is therefore a key partner to work with to improve health in other LMICs.

Examples of this partnership in action including building on China's unprecedented success in tackling infant and maternal mortality, with DFID working to build capacity in low-income countries (LICs) to learn from this experience; and improving access to medicines in LICs through improving China's contribution to the supply of quality pharmaceutical products.⁽¹⁵⁰⁾

The CDC Group plc

CDC Group plc, formerly the Commonwealth Development Corporation, is the UK's development finance institution (DFI) and is 100% owned by the UK government, with the high-level strategy set in conjunction with DFID. It is the world's oldest DFI, investing in businesses in Africa and Asia where 70% of the world's poor live, making investments where they will have the greatest development impact including in health. With a history of successful investments, the CDC Group is self-funding, not receiving any funds from the taxpayer since 1995, with over £2.5bn invested in almost 1,300 companies, supporting over 1m jobs in 75 countries.⁽¹⁴⁰⁾

CDC Group has investments in hospitals, pharmaceutical, biotechnology and medical technology companies across its portfolio. In many of these countries there is an absence of long-term capital funding, and investments made by the CDC Group allow local providers to expand their operations and reach more people with effective healthcare, medicines, and devices.⁽¹⁵¹⁾ Examples include:

1. Narayana Health: In 2015, CDC Group invested \$48m in Narayana Health, a chain of hospitals providing high-quality, low-cost healthcare across India. This investment allowed it to expand in low income states to drive down the cost of quality care to lower and middle-income patients.

2. Abacus Parenteral Drugs: In 2010, CDC Group invested €6.8m in establishing Abacus Parenteral Drugs. This was the first manufacturing facility of its kind in Uganda, developing lifesaving IV fluids and sterile water for Uganda, Burundi, Rwanda, Eastern DRC, South Sudan, Kenya and Tanzania. The creation of a domestic industry created skilled employment, but also enabled low-income groups to benefit from lifesaving products due to lower pricing than imported products.

How DFID works through multilateral institutions to improve health in LMICs

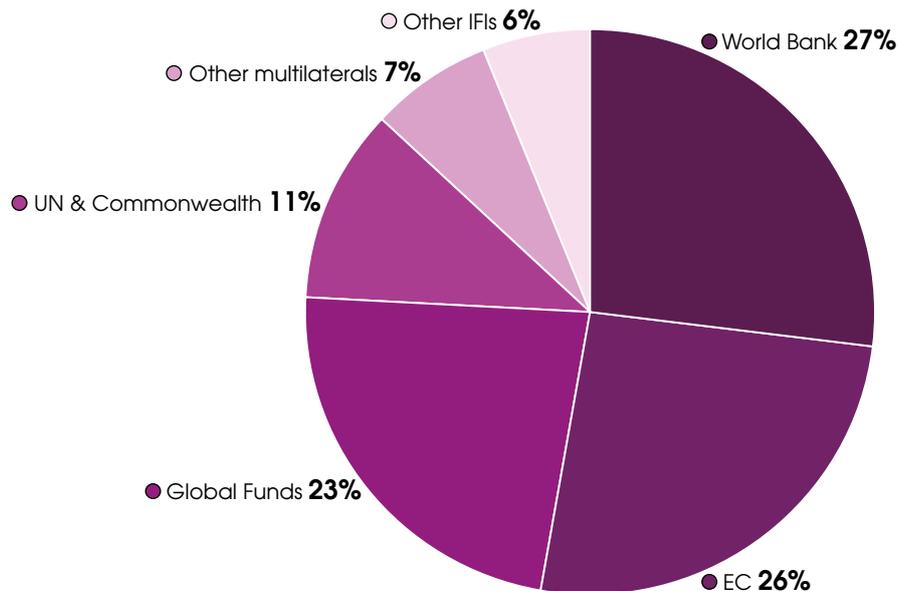
In addition to focusing bilateral aid in priority countries, DFID contributes to improved health across the world through its funding to multilateral institutions. These institutions have a broad global reach and pool funds from donors to deliver aid programmes efficiently and at scale.

In order to ensure the effectiveness of spending through multilaterals, DFID carried out a comprehensive 'Multilateral Aid Review' (MAR) in 2011 of all the agencies that it provides significant funding to. The best performing multilaterals received a larger share of funding and the worst performing no longer received any funding. The review also made recommendations to each multilateral agency on how to improve effectiveness and considered the progress that they had made in 2013 in order to inform future funding. This process allowed DFID to both increase the value for money of its spending, and make a real contribution to increasing efficiency across the multilateral system.

“ The multilateral aid review was an example of DFID being a global leader in improving governance for health and other multilateral priorities – DFID was explicit as a large donor can be, but other donors also used DFID’s findings to direct their money in a similar way, magnifying the effect ” .

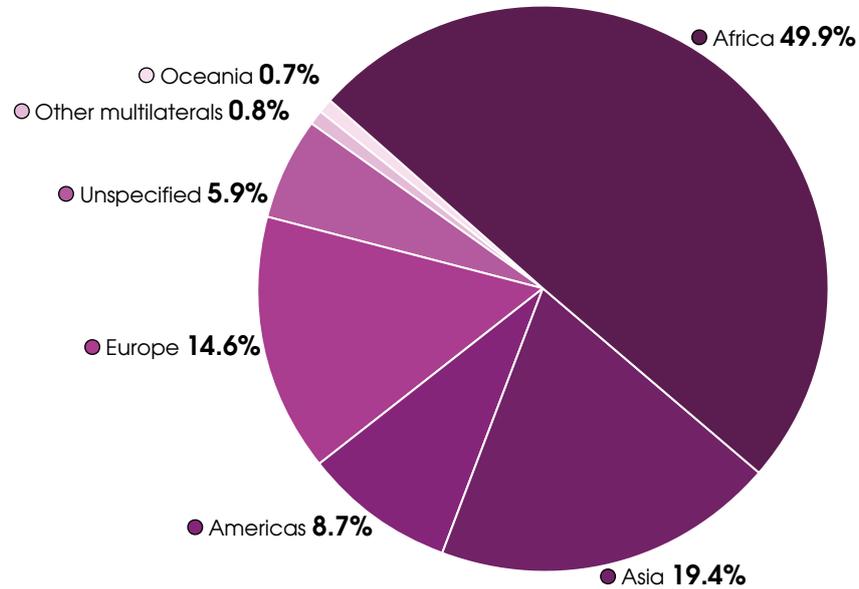
There are a large number of multilateral agencies that DFID funds to improve health across the world. These include the World Bank and other International Financial Institutions (IFIs), the European Commission (EC), the Global Fund, and UN and Commonwealth bodies. DFID’s assistance to these institutions includes both core funding to be spent by these bodies as they deem most appropriate, and through non-core funding to deliver specific funding. The distribution of DFID’s core funding to multilaterals, and the geographic focus of the multilaterals the DFID funds are shown in Figure 23a-b.⁽¹⁴⁰⁾

Figure 23a: DFID core multilateral funding in 2013/14 by recipient



Source: 'DFID Annual Report and Accounts 2013/14'

Figure 23b: DFID core multilateral funding in 2013/14 by geographic focus



Source: DFID Annual Report and Accounts 2013/14

World Bank Group (WBG)

The largest proportion of DFID's multilateral funding (27% in 2013/14) goes to the WBG, a family of five institutions that work together to achieve the twin goals of ending extreme poverty and building shared prosperity. DFID is one of the top five shareholders and donors to the WBG, and the largest contributor to the International Development Association (IDA), the arm focused on the poorest countries and therefore most aligned with DFID's objectives. The next largest donors to the IDA are the USA, Japan and Germany.⁽¹⁵²⁾

The two key institutions of the WBG for improving health are the IDA and the International Bank for Reconstruction and Development (IBRD) which is focused on middle-income countries. The IDA and IBRD provided loans and grants of \$40.8bn in US fiscal year 2014, 8% of which were directed towards improving health and other social services and 11% of which were directed towards improving water, sanitation and food protection.⁽¹⁵³⁾ In line with its global strategy for health, nutrition and population, the World Bank supports countries in their path to achieve universal health coverage (UHC) through:

- Providing financing, analysis and policy advice to help countries expand access to quality, affordable healthcare
- Protecting people from falling into poverty or worsening poverty due to illness
- Promoting investments in all sectors that form the foundation of healthy societies

Between 2002-2013, the IDA has:⁽¹⁵⁴⁾

- Provided more than 117 million people with access to basic packages of health, nutrition, or reproductive health services
- Trained more than 2.6 million healthcare workers and constructed, renovated, and/or equipped more than 10,000 health facilities
- Immunised nearly 600 million children
- Provided more than 194 million pregnant women with antenatal care and ensured that more than 29 million births were attended by skilled personnel
- Ensured that more than 210 million pregnant or lactating women, adolescent girls, and children under age five were reached by basic nutrition services
- Purchased and/or distributed more than 149 million long-lasting, insecticide-treated malaria bed nets and more than 386 million condoms
- Provided more than 7.6 million people with TB treatment and ensured that more than 1.3 million adults and children received antiretroviral therapy (ARVs)

The UK has also used its influence on the WBG Boards to strongly support the World Bank Reform process that started in 2014, working together with other shareholders to ensure that the vision for a more flexible, efficient, country focused and coherent WBG is realised. It has also secured increased funding for fragile states and the poorest countries, and a stronger focus on girls and women in the WBG's operations.

Global Funds

The second largest proportion of DFID's multilateral funding (23% in 2013/14) goes to the Global Funds. These make a major contribution to improving health globally, and include the GAVI Alliance (GAVI) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM). DFID also sits on the boards of GAVI and GFATM, working collaboratively with other donors to support strategy development, and using its influence to improve the effectiveness and efficiency of their operations.

The UK is the largest donor to GAVI, contributing 29.6% of all funding between 2011 and 2014, and played a key role in setting it up as one of the six original donors.⁽¹⁵⁵⁾ GAVI spent \$1.6bn in 2013 to increase access to immunisation in over 75 countries, supporting the immunisation of over 48 million children and contributing to preventing over 900,000 additional future deaths.⁽¹⁵⁶⁾ Examples of their contribution to reducing mortality include supporting vaccines against pneumococcal disease and rotavirus, major causes of infant mortality; and supporting vaccination against Human Papilloma Virus (HPV) which causes cervical cancer, a leading cause of deaths in women in sub-Saharan Africa. To achieve its goals, GAVI also works on strengthening health systems in many of these countries.

The UK is the third largest donor to GFATM since its inception, and the second largest donor today behind the USA, contributing 15.6% of all funding in 2014.⁽¹⁵⁷⁾ It was also one of the original donors and played a key role in its founding. GFATM spent \$3.9bn in 2013 to support programmes to prevent and treat HIV/AIDS, TB and malaria in more than 140 countries, including on strengthening health systems. In 2013 it accounted for 20% of all international funding for HIV/AIDS, 75% of funding for TB and 66% of funding for malaria. In 2013, GFATM's key achievements included: 1.9 million people receiving ARVs, 670,000 HIV positive women receiving ARV prophylaxis for the prevention of mother-to-child transmission and detecting and treating 1.5 million new cases of TB. GFATM has also made a major contribution to the 30% fall in new HIV infections between 2001-2012, 42% fall in malaria mortality between 2000-2012 and 45% fall in TB mortality between 1990-2012.⁽¹⁴⁰⁾

The UK is also the largest state donor to the Global Polio Eradication Initiative (GPEI), supporting 120 million polio vaccinations in 2013/14.⁽¹⁵⁸⁾

European bodies

The main European instruments that contribute to improving health globally are the European Development Fund (EDF), the EU budget for development and the Humanitarian Aid and Civil Protection Department of the EC (ECHO). The total net ODA from European institutions in 2013 was \$16bn, making the EU the 3rd largest donor in the world. Approximately 15.4% of this was spent on health (3.5%), water and sanitation (3.6%) and humanitarian aid (8.3%).⁽¹⁵⁹⁾

The EDF represents approximately 30% of European ODA, and is the main European mechanism for development funding in African, Caribbean and Pacific countries, with over 80% of the budget in 2012 spent in LICs. The UK is the 3rd largest donor to the EDF after Germany and France.⁽¹⁶⁰⁾ Contributions to the EDF are separate from the compulsory contribution to the EU budget paid by member states, therefore the UK's contribution reflects the alignment of the EDF's strategy with DFID priorities.

The EU budget for development represents approximately 70% of European ODA. This budget is a fixed proportion of the overall EU budget, to which the UK is the 4th largest contributor (in absolute terms), behind Germany, France and Italy. Part of this budget is allocated to development investment in geographic programmes in Asia, Latin America, Eastern Europe, the Middle East and South Africa, including programmes that work to improve the health of populations in these regions. In addition to geographic programmes, the EU also invests in health through the 'Investing in People' initiative, aimed at addressing the lack of healthcare workers in many countries, as well as focusing on HIV/AIDS, malaria and TB, and sexual and reproductive health and rights. The EC also provides additional support to other multilaterals, including the WHO, GFATM and GAVI.⁽¹⁶¹⁾

ECHO is the EU's humanitarian assistance agency, reaching 124 million people in 90 non-EU countries in 2013. These include the Syria crisis for which it was the largest donor, conflict zones including the Central African Republic, Somalia, the DRC and Yemen, and disasters including Typhoon Haiyan, and floods in Bangladesh and Mozambique. Of the €1.35bn budget, a significant proportion was spent on protecting the health of affected populations, including 40% on food and nutrition, 19% on shelter, 13% on health and 13% on water and sanitation.⁽¹⁶²⁾

UN bodies and the ICRC

DFID funds a range of UN bodies that contribute to improving health globally. These include: UNAIDS, United Nations Development Programme (UNDP), United Nations Population Fund (UNFPA), United Nations High Commissioner for Refugees (UNHCR), United Nations Children's Fund (UNICEF), UNITAID, United Nations Office for the Coordination of Humanitarian Affairs (OCHA), World Food Programme (WFP) and the World Health Organisation (WHO).

The UK is a major donor to these institutions, and uses its influence to improve the effectiveness of these actors in improving the lives of people across the world. The most recent public figures at the time of this report show that the UK is the largest state donor to the UNFPA, UNICEF and OCHA, the 2nd largest state donor to UNHCR, WFP and WHO (behind the USA for each) and the 3rd largest state donor to UNDP (behind Japan and Germany).⁽¹⁶³⁻¹⁶⁹⁾ It was also one of the five founding partner countries of UNITAID and a significant donor to UNAIDS. Funding to the WHO consists of 'assessed contributions' based on each country's ability to pay and 'voluntary contributions' made in excess of this. UK assessed contributions

come from DH and represent approximately 15% of total UK contributions, with the remaining 85% of voluntary contributions coming from DFID. DH is the lead organisation for the UK's engagement with WHO, but DFID also actively engages on development priorities.

These UN agencies spend billions of dollars every year working to improve health and development across the world. Their remits with regard to health extend from the WHO's role as the directing and coordinating authority for international health; to UNICEF and UNFPA's roles as the lead agencies for maternal & child health and sexual & reproductive health and rights respectively; to UNDP's role in supporting health outcomes through helping countries to address the social, cultural and economic determinants of health. UNICEF, UNHCR, OCHA and the WFP play a key role in protecting the health of refugees and those caught in humanitarian emergencies and natural disasters, providing lifesaving food, healthcare, water and sanitation services. A full account of the achievements of these organisations in improving health made possible through the funding provided by the UK and other donors is clearly outside the scope of this report, but they include significant improvements across every sub-sector of health and in almost every country in the world.

DFID's funding to the International Committee of the Red Cross (ICRC) comes under 'other multilaterals', and the UK was the 2nd largest donor in 2013 (behind the USA).⁽¹⁷⁰⁾ The ICRC works to save lives and protect the dignity of victims of armed conflict, working in over 55 of the most fragile and conflict affected states in the world. In 2013, ICRC delivered health services to 8.2 million people, food assistance to 6.8 million people and water, sanitation and construction projects to 28.7 million people. In addition to these activities, the ICRC has continued to advocate for important issues including violence against people giving or receiving healthcare and the causes and effects of sexual violence in armed conflicts.⁽¹⁷¹⁾

How DFID has shifted global policy and progress in health

DFID has been the lead organisation for the UK's advocacy in tackling health issues that affect the poorest across the world. At one level this has included advocating for progressive reform in multilateral institutions as discussed above, including working in partnership with the DH on WHO reform. At another level this has involved accelerating momentum generated by the countries themselves and galvanising global support around specific health challenges. In addition to DFID's leadership in malaria and NTDs discussed in Chapter 1, two further examples of are highlighted here.

Female genital mutilation (FGM) and child, early and forced marriage (CEFM)

In 2013, the UNFPA estimated that there were 39,000 child marriages every day, or 140 million between 2011 and 2020. In addition to being a gross violation of human rights and depriving girls of a future of their own choosing, early marriage also increases the likelihood of intimate partner violence and sexual abuse, and complications from pregnancy and childbirth are the leading cause of death in young girls aged 15-19.⁽¹⁷⁷⁾ Likewise, FGM is recognised internationally as a violation of the human rights of girls and women, and can cause significant health complications including severe bleeding, problems urinating, infertility and complications in childbirth including an increased risk of newborn deaths.⁽¹⁷³⁾

In July 2014, the UK government and UNICEF co-hosted the 'Girl Summit' in London. This brought together a range of stakeholders to accelerate momentum in tackling FGM and CEFM, with the ultimate goal of ending these practices globally within a generation. Importantly, this movement was not initiated by the UK; instead DFID's work focused on supporting and amplifying leadership in Africa and Asia on these issues.

A key outcome was the Girl Summit Charter which outlines an agenda for change, and has been signed by 48 governments and devolved administrations, and over 400 individuals and organisations. In addition to this, over 180 governments, organisations and individuals have made commitments to new actions to end FGM and/or CEFM, and a UK inter-faith declaration condemning FGM was signed by approximately 300 faith leaders and representatives. A 'Task Team' has been appointed to track and promote progress on commitments, and the first annual update will be published in July 2015.

Accelerating progress on global undernutrition

Undernutrition is responsible for 45% of all child deaths globally and is estimated to undermine economic productivity by 11% in Africa and Asia. Globally, nearly 1 in 4 children under 5 are stunted, with the 'first one thousand days of life' from conception to two years being the critical period during which stunting can be addressed.⁽¹⁷⁴⁾ Despite this enormous global burden, and the Copenhagen Consensus review showing that every pound spent on nutrition interventions saves an average of £45, progress on tackling undernutrition has been slow.⁽¹⁷⁵⁾

Building on action and leadership by LMICs where the burden of disease from undernutrition falls, DFID has sought to accelerate progress by bringing donors together and raising the profile of this issue on the global stage. In June 2013 the UK and Brazilian governments together with the Children's Investment Fund Foundation (CIFF) co-hosted the international 'Nutrition for Growth' summit in London, following on from the UK-Brazil Hunger Summit in London the previous year.⁽¹⁷⁶⁾

A key outcome was the Global Nutrition for Growth Compact with commitments to reduce the burden of undernutrition, signed by over 100 stakeholders including governments, businesses, civil society organisations and others. These commitments included reaching at least 500 million pregnant women and young children with effective nutrition interventions and reducing the number of stunted children by 20 million by 2020. A commitment was also made to track progress up to and beyond the Rio Olympic Games in 2016.⁽¹⁷⁷⁾

In addition to this, the summit led to international financial commitments of £2.7bn to support direct nutrition programmes, and £12.5bn for programmes in agriculture, water, sanitation and hygiene and social safety nets to deliver improved nutrition results. 14 LMICs committed to increased domestic resources for nutrition, and 22 companies pledged to improve the nutrition of almost a million employees in over 80 countries. DFID itself committed to triple its investment in nutrition-specific programmes between 2013 and 2020.

Conclusions

Contribution of the state sector to improving health and shared prosperity across the world

1. **The UK state sector contributes to improving health across the world through:**
 - a. Demonstrating global leadership in health, including the commitment of all parties to a cross-government global health strategy, since used as a model for other countries. Other areas of leadership include leading the fight against dementia, antimicrobial resistance, malaria and NTDs on the global stage; leading the response to the Ebola epidemic in Sierra Leone; galvanising donors and accelerating progress on FGM and child marriage and global undernutrition; and co-chairing the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda.
 - b. The NHS and other actors in the UK health system using their expertise to improve health in countries at all stages of economic development, including the contribution of the NHS to research and academia; training health professionals from abroad; and partnerships on a commercial and philanthropic basis, contributing to health systems strengthening across the world. Contributions made by other actors include PHE and global health security and responding to public health emergencies; NICE and strengthening health systems through better use of evidence and prioritisation of resources; and the MHRA ensuring the safety of drugs and medical devices across the global supply chain. Non-publicly funded actors include the Royal Colleges, professional regulators, and trade unions and professional bodies that have raised the standards of education, training and clinical practice across the world; advocated on global health issues; and shared best practice through the publication of world leading journals and hosting international conferences.
 - c. The UK's role as the second largest donor government in the world, with DFID contributing to improving health through working bilaterally in priority countries to fund health system strengthening and targeted health interventions, with health the largest single sector of activity. DFID also funds multilateral institutions that work in health across the world, including the World Bank and the EU, GFATM and GAVI, WHO and UN bodies, and other multilaterals such as the ICRC. Additionally, DFID makes a major contribution to saving lives and protecting health in humanitarian emergencies as one of the largest contributors to humanitarian aid in the world; is the 2nd largest funder of international health research in the world; and leads the government's efforts to advocate for better health in poor countries.
 - d. Supporting the other three sectors to improve health and shared prosperity across the world.
2. **This activity improves health and prosperity abroad, but also benefits the UK population through:**
 - a. Improving the productivity of NHS workers through education and training, improvements in morale, and leadership development that come through NHS staff volunteering and working in other countries. There have been numerous examples of NHS patients that have benefitted from innovations that were developed through knowledge and ideas gained from working abroad.

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- b. Staff working in PHE, NICE, the MHRA, Royal Colleges and other organisations developing their skills and expertise through working and collaborating internationally, then using this expertise to benefit the UK public.
 - c. Revenue generated from working internationally which is re-invested in improving health in the UK, including commercial partnerships made by NHS hospitals and some of the work of MHRA and PHE.
 - d. The NHS and DFID, and the high regard in which they internationally making a strong contribution to the UK's soft power and international influence.

The state sector's weaknesses and vulnerabilities with regard to its contribution to improving health and shared prosperity across the world

1. **Certain weaknesses were identified that currently limit the contribution that the state sector can make, including:**
 - a. Poor coordination and weak relationships between UK state sector actors, including DFID, DH, the NHS, NICE, PHE, Royal Colleges and many of the other bodies described in this chapter with regard to their international activities. DFID has made only limited use of UK expertise in healthcare such as providing funding for NICE International, the Health Partnerships Scheme through THET and UK-Med; the Royal Colleges largely work independently of one another in the international arena; and the existing fora for coordination such as the AoMRC International Forum and the NHS International Group have not yet been successful in tackling this challenge.
 - b. A range of persisting barriers to volunteering, despite unqualified support for NHS staff working and volunteering overseas at the policy level, and a clear understanding of the benefits to both the NHS and the host country.
 - c. An over-reliance on the NHS model as a route for strengthening health systems abroad, and a comparative weakness in understanding the delivery of healthcare through the private sector. A key challenge for the sector is how to effectively utilise the wealth of experience from the NHS model of care where applicable and relevant, and the values of universal healthcare, without 'imposing' the NHS model.
 - d. Major gaps in geographic coverage, with the focus of its attention in health on the poorest countries in Sub-Saharan Africa and South Asia, and emerging economies in Brazil, China, India, South Africa and the Middle East, together with its influence in the EU. This leaves considerable gaps including South and Central America, Central Asia, Oceania and a number of other countries in Africa. These gaps limit the UK's ability to use its expertise to improve health in these countries, and also limit its ability to respond to global health emergencies in these countries that may threaten health in the UK and across the world.

2. **Additionally, looking ahead there were also threats that were identified to the state sector's ability to continue to take a strong role in health globally, including:**
 - a. Despite its strong reputation globally, the challenges for the NHS domestically were highlighted as a major threat to the UK's reputation in health internationally, and the contribution that this makes to the UK's soft power. Accordingly, ensuring that the NHS continues to live up to its values of quality healthcare, free at the point of use, based on clinical need and not ability to pay is important not only for the health of the UK population, but also internationally. In addition to increased funding, the need for a stronger focus on prevention of ill health was highlighted as a crucial factor in addressing this.
 - b. Contributing to this, a major concern highlighted by respondents was the threat of immigration reform adversely affecting the ability of the NHS to attract and retain the best talent from across the world, and the impact that this will have on quality of care in the NHS. This includes the impact on the ability to recruit the most experienced leaders as well as the ability to retain experienced front-line staff of other nationalities.
 - c. With regard to DFID, the major threat identified was the risk to the quality of DFID's work with a rising budget, now pegged to at least 0.7%/GNI, without a parallel increase in the number of civil servants to manage this flow of money effectively. As with the NHS, the quality of DFID's work affects not only the recipients of its ODA spending, but also the UK more generally through the contribution of DFID's reputation to the UK's soft power.

The strengths and potential for growing the contribution of the state sector to improving health and shared prosperity across the world

1. **The strengths of the UK state sector that enable it to effectively contribute to improving health across the world include:**
 - a. The reputation of the UK health system, including the values of universal health coverage and the cost-effectiveness and equity of access in the NHS. Particularly respected are the UK's depth of expertise in primary care, public health, and the work of NICE in promoting evidence-based medicine and prioritisation of resources. The UK also has breadth of expertise across all health professions and disciplines, from nurses to dietitians, doctors to physiotherapists, laboratory workers to managers and many more.
 - b. The quality of postgraduate education, training and regulation in health, developed and maintained by the Royal Colleges, professional regulators such as the GMC and other supporting bodies.
 - c. The commitment of the UK to maintaining DFID as a stand-alone cabinet level department spending 0.7% of GNI on ODA, with a significant proportion on health.
 - d. The relationships and expertise that DFID have developed in improving health in LMICs, including the commitment to partnership working, south-south collaborations and country-led approaches to health systems strengthening.
 - e. The tradition of collaborations between the NHS, NGOs and universities.

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2. **Building on these strengths and looking ahead, there are several opportunities to grow the contribution of this sector to improving health across the world, including:**
- a. Taking a global leadership role in health systems strengthening (HSS), building on DFID's strong reputation in HSS, partnership working and country-led approaches to ensure that donors and development partners align behind a HSS agenda that is country-led and tailored to the needs of those countries. This should be complemented by a stronger leadership role in global health security, drawing on the expertise in DFID, DH, PHE, the FCO and other departments. Stronger health systems lead to healthier and more productive populations in those countries, whilst also preventing disease threats from crossing borders, benefiting populations across the world.
 - b. Using the range of UK expertise in health across DFID, NICE International, PHE, the Royal Colleges and other UK actors in a more coordinated way to improve health systems across the world, from low-income to high-income countries, through philanthropic and commercial partnerships respectively. This will contribute to improvements in the quality, cost-effectiveness and equity of access to healthcare across the world, but critically should also lead to a strong focus on the prevention of ill health. Prevention is key to stemming the rise of NCDs across the world, placing unsustainable cost pressures on health systems in OECD countries and LMICs alike.
 - c. Building on the existing work of DFID, NICE International and others in developing global partnerships with emerging economies and promoting South-South learning, to encourage the dissemination of learning and successful approaches to strengthening health systems. This will also maximise the potential of the comparative advantage of countries such as India and China in supplying low-cost high-quality drugs and medical technologies to the developing world, accelerating the drive towards UHC.
 - d. Taking a stronger lead in addressing the absolute shortage of health workers across the world, ensuring that the skill-mix across the whole range of the health workforce is appropriate for the needs of those countries. HEE, Royal Colleges, Universities and many other UK actors can play an important role in tackling this challenge.

3. The Academic Sector

What do we mean by the 'academic sector'?

The 'academic sector' includes actors that fund and carry out health research, as well as those who engage in the education of health professionals and health researchers. The generation and dissemination of health research leads to significant improvements in health globally, contributing to the development of new drugs and medical technologies, more effective ways of strengthening health systems and a better understanding of health and disease and how people experience them. Training high quality health workers and researchers leads to more effective healthcare in the UK, but also improved healthcare across the world through health professionals working and volunteering overseas and engaging in research on health challenges that affect us all.

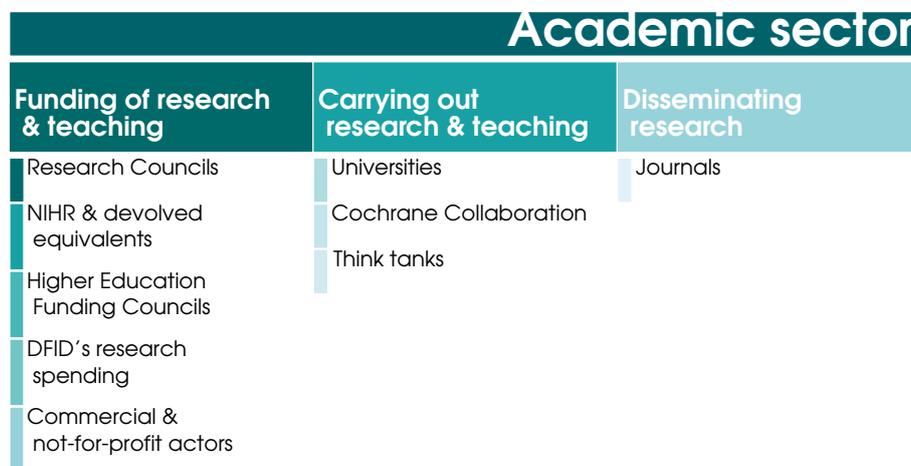
The UK has a broad range of actors that are active at each stage of this process. Those that fund research include government bodies such as the Medical Research Council (MRC) and other Research Councils, the National Institute of Health Research (NIHR), the Higher Education Funding Councils and the Department of International Development (DFID). In addition to these publicly funded bodies, major health research funders include life sciences companies which are discussed further in Chapter 4 and medical research charities and the Wellcome Trust discussed further in Chapter 5. Actors that carry out research include universities, both individually and in partnership, the Cochrane Collaboration and think tanks such as Chatham House and the Overseas Development Institute (ODI). Universities also teach and train health professionals and health researchers. Actors that publish and disseminate research include the major UK journal groups: the Lancet, the BMJ and Nature.

This chapter focuses on academic output that is focused on the health and medical sciences, however it is important to note that academic research and the training in engineering, management, economics and many other disciplines all make important contributions to improving health. Mapping the contribution of these actors is beyond the scope of this chapter, and accordingly the total contribution of the UK academic sector to improving health globally is broader than what is mapped here.

Outline of the chapter

As shown in Figure 24, the academic sector has three main areas that follow the natural stages of the research process, from actors that fund research, to those that carry out the research, to those that disseminate it. Accordingly, the chapter will first consider research and higher education funding in the UK, looking in closer detail at government research funding bodies. It will then look at the universities and their role in teaching health professionals and researchers and carrying out research, as well as the quality of UK academic research. It will then discuss the Cochrane Collaboration and the role played by UK think tanks in generating policy focused research, and look at the contribution made by medical and health journals based in the UK. Finally, the chapter will conclude by bringing together the contribution of the academic sector to improving health and shared prosperity across the world, as well as the challenges and opportunities looking to the future.

Figure 24: Outline of the academic sector



Health research funding

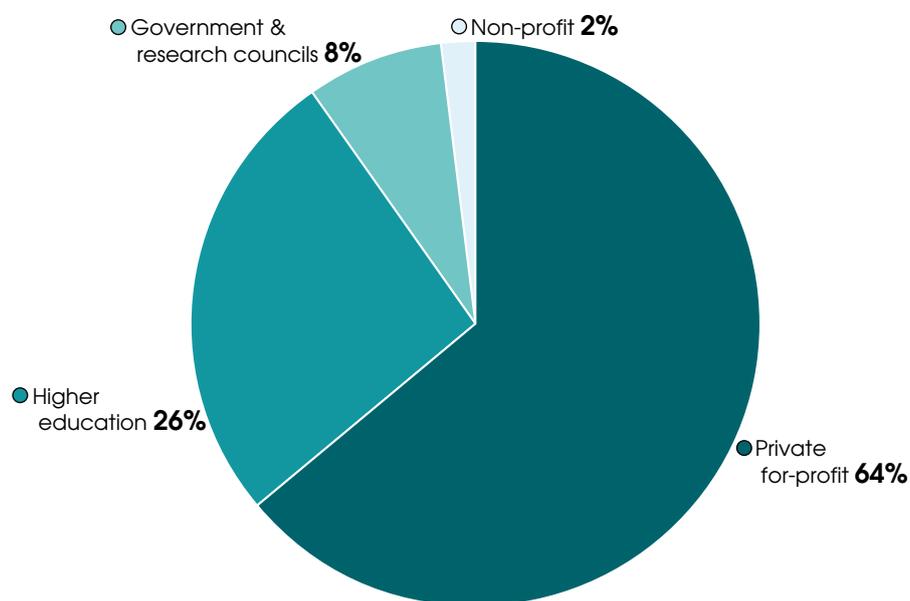
Overview

This section will look at sources of research and development (R&D) funding in the UK – first more broadly across all sectors in the UK economy, and then specifically for health related R&D. It will then consider the main areas of health research that are funded in the UK, before looking in more detail at specific actors disbursing public funding for health research. The contribution made by life sciences companies and the Wellcome Trust and medical research charities are covered in overview, but discussed in further detail in chapters 3 and 4 respectively. These actors span the whole spectrum from those funding research purely focused on health challenges primarily seen in high-income countries (e.g. NIHR) to those with mixed portfolios (e.g. MRC and the Wellcome Trust) to those focused exclusively on research in low- and middle-income countries (DFID's research spending). However, much of the health research conducted has broad applicability, and as global public goods for health can lead to improvements in health in populations across the world.

Sources of R&D funding in the UK

Domestic expenditure on R&D includes government and higher education funding, charitable funding and business funding – together this is referred to as 'gross domestic expenditure on research and development' (GERD), the preferred measure for international comparisons. The ONS reports that in 2013, the UK's GERD increased by 5% in real terms from 2012 to £28.9bn, of which pharmaceuticals was the largest single area at £4.1bn. The contribution of the different sectors to this is shown in Figure 25, highlighting the important role played by the commercial sector. UK R&D spending was 1.67% of GDP in 2013, up from 1.62% in 2012 but lower than the peak of 2.03% in 1986. The EU-28 average was 2.02%, with the UK ranking 12th. There has also been a steady rise in the proportion of funding for UK R&D expenditure from overseas, from 16% in 1996 to 19% in 2013.⁽¹⁷⁸⁾

Figure 25: Composition of UK GERD by sector of funding



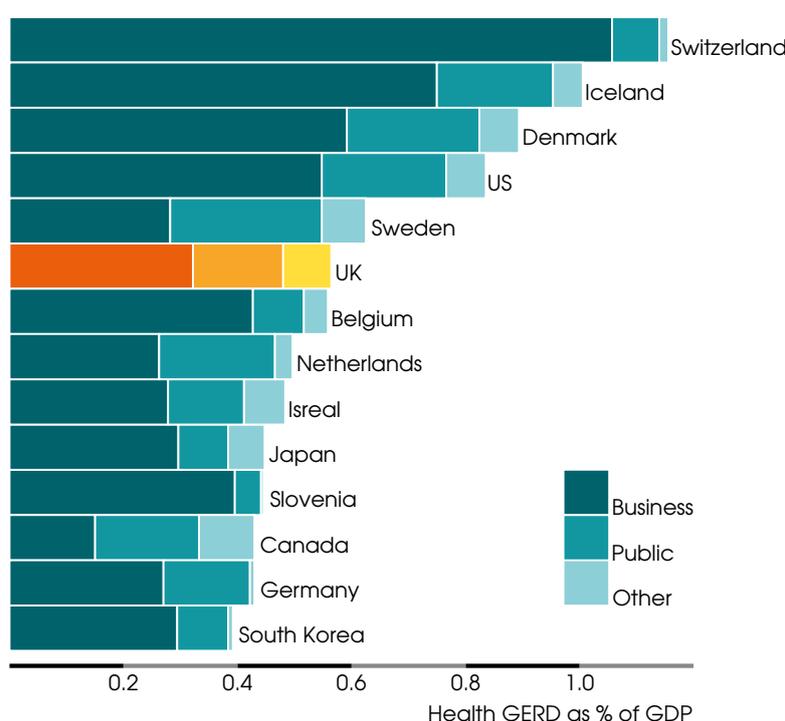
Source: Office for National Statistics, UK Gross Domestic Expenditure on Research and Development, 2013

The contribution of the government to R&D funding has been criticised by ‘Science is Vital’, a grassroots campaign of UK scientists and supporters. Their analysis highlights that following the 2010 freeze on the science budget by the Treasury, UK investment in publicly funded research dropped to less than 0.5% of GDP in 2012, the lowest point for over 20 years. This places the UK at the bottom of the G8 countries (spending an average of 0.77% of GDP), and significantly lower than the Eurozone (0.73%) and OECD (0.71%) averages.⁽¹⁷⁹⁾ The campaign notes that the UK has a highly efficient research sector that masks the impact of the relatively low levels of government funding. An analysis of the international comparative performance of the UK research base in 2013 noted that sustaining the UK’s position in research will be difficult with stagnant or falling levels of spending.⁽¹⁸⁰⁾

Looking more specifically at health research funding in the UK, the total health research spending from the charity sector (£1.3bn), industry (£4.1bn), NIHR (£1.1bn), and MRC (£845m) came to over £7.3bn in 2013/14. However, this figure increases considerably when further sources of funding are taken into account, including the parallel bodies to the NIHR in the devolved governments; other research councils including the Biotechnology and Biological Sciences Research Council (BBSRC) and the Economic and Social Research Council (ESRC); government spending on universities through the Higher Education Funding Councils; government funding through Innovate UK and capital spending; and international funders including the Bill & Melinda Gates Foundation and the EU.⁽¹⁸¹⁾ It is important to note, however, that these research budgets include spending on research infrastructure and training and career development.

An analysis of the global landscape of health R&D spending published in 2013 showed that the UK spent the 4th highest amount on health research in 2009 at \$12bn, after the USA (\$119 billion), Japan (\$18 billion), Germany (\$13 billion). As a proportion of GDP, the UK spent the 6th highest amount after Switzerland (1.16%), Iceland (1.01%), Denmark (0.89%), the USA (0.84%) and Sweden (0.63%). In the UK, more than 50% of health R&D expenditure was funded by the commercial sector, 30% by the public sector, and less than 20% by other sources (including not-for-profit organisations).⁽¹⁷³⁾ As shown in Figure 26, the relative proportion of the UK's commercial funding sources is lower than the USA, Denmark and Switzerland but higher than Sweden and the Netherlands.

Figure 26: Health GERD across countries in 2009 as a % of GDP



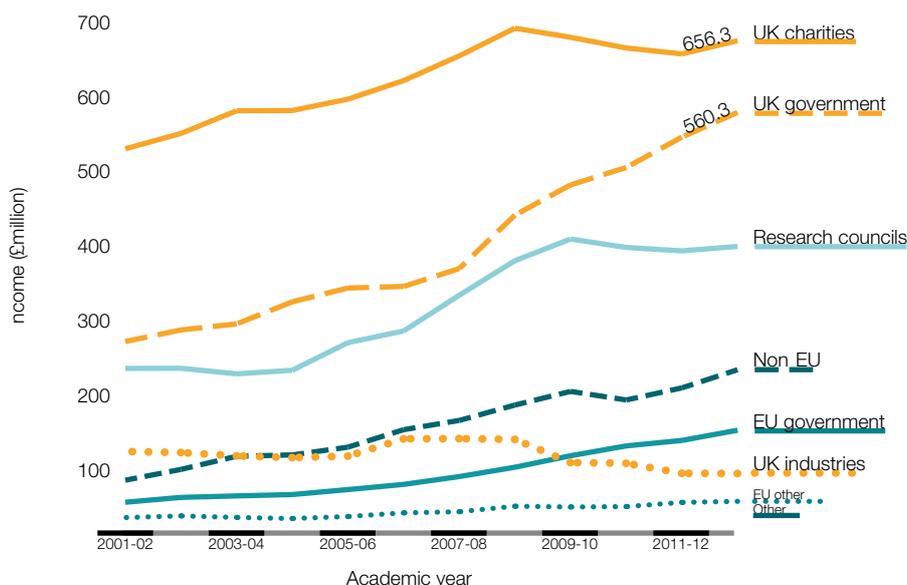
Source: Reproduced from: Rottingen J-A, Regmi S, Eide M, *et al.* Mapping of available health research and development data: what's there, what's missing, and what role is there for a global observatory? *The Lancet*. 2013

With regard to health research in low- and middle-income countries (LMICs), the UK Collaborative on Development Sciences (UKCDS) brings together a group of 14 UK government departments and research funders working in international development, with global health one of the priority areas of work. They note that the percentage of UK public R&D spending on international development has risen from less than 6% to 8.3% of public R&D funding between 2012/13 and 2013/14. Health research makes up a significant proportion of this, with the major funders in this area being DFID, MRC, the Wellcome Trust and other Research Councils.⁽¹⁸³⁾ A key strength of the health research environment in the UK is collaborative working between these key funders, and UKCDS plays a key role in bringing them together to discuss research priorities in international health.

Looking more specifically at health research grants and income for UK universities, the trend in funding between 2001 and 2013 by source is shown in Figure 27.⁽¹⁸⁴⁾ This shows that the main sources of funding are charities, followed by the government and research councils. Whilst UK charity and government funding has increased

between 2001 and 2013, reaching over £500m for each source, industry funding has been decreasing since 2006/7 and is currently below £100m. The research areas included in this dataset are clinical medicine, public health, health services and primary care, allied health professions, dentistry, nursing and pharmacy, psychology, biomedical sciences, agriculture, veterinary and food science.

Figure 27: Main sources of funding for research grants and income reported by UK Higher Education Institutions between 2001-2013



Source: Higher Education Statistics Agency, 2014

The UK's strong research base also contributes to significant inward funding in health research. The UK is the second largest recipient of health research funding from the Bill and Melinda Gates Foundation, with UK universities and institutions receiving \$124m between 2013 and May 2015.⁽¹⁸⁵⁾ With regard to Europe, the Seventh Framework Programme (FP7) was the main mechanism used by the European Commission to fund research across Europe between 2007 – 2013, with the MRC acting as the UK lead on the FP7 Health Programme Committee. The UK was the top beneficiary of funding in health research, receiving a total of €653m. The MRC also represented the UK on the Member States representative group of the FP7 Innovative Medicines Initiative, supporting industry-academia collaborations to boost pharmaceutical innovation in Europe. In the first five IMI calls, UK scientists received over 30% of the available funding, considerably higher than any other member state. Finally, the Marie Curie Action (MCA) Programme of the FP7 is designed to develop human capital in research, bringing talented researchers to develop their skills and contribute to the research base of the Member States. The UK has attracted the most Marie Curie fellows from across Europe and globally into the UK, with 2,953 projects funded compared to 1,588 for Germany in 2nd place.^(186, 187)

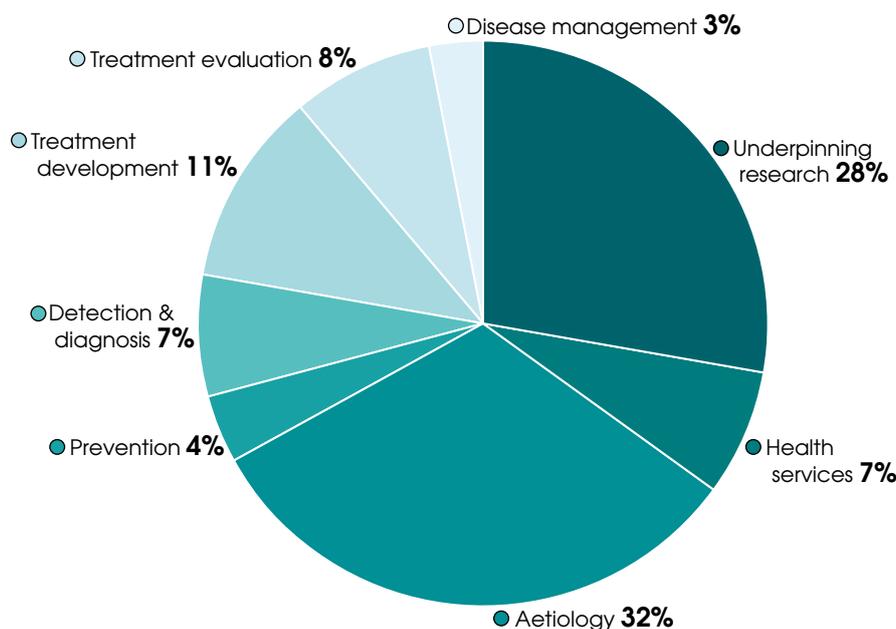
In addition to contributing to improving health outcomes, government investment in health research also produces significant returns to the UK economy. A study looking at economic returns from cancer research in the UK between 1970 and 2009 found that every pound invested in cancer research generates a stream of benefits equal to earning 40 pence per year in perpetuity: a 40% annual return on investment.⁽¹⁸⁸⁾ A separate study found that for each pound invested in cardiovascular disease and mental health research, a stream of benefits is produced

equivalent to earning 39 pence and 37 pence respectively in perpetuity.⁽¹⁸⁹⁾ In addition to this, each pound invested in UK medical research through public or charitable funding yields £2.20 - £5.10 of additional industry investment, together earning an extra £1.10 - £2.50 per year for the UK economy.⁽¹⁹⁰⁾ Finally, health research represents a significant proportion of the UK's science base, which employs over 200,000 workers across the UK.⁽¹⁹¹⁾

Areas of health research funded in the UK

An analysis of UK health research funding from 12 of the largest funders in 2004/5 and 2009/10 showed broad similarities in the proportion of funding for different research activities and health categories in these two periods. Whilst this analysis did not aim to capture the totality of UK health research funding and the areas have not been updated since 2009/10, this still provides an overview of the relative importance of different areas of health research spending in the UK.⁽¹⁹²⁾ Figure 28 shows the proportion of combined total spend by research activity in 2009/10, showing the largest proportion of funding dedicated to 'aetiology' looking at the causes of ill health; and the second largest proportion dedicated to 'underpinning research' aimed at understanding basic science and socioeconomic processes that form the basis for subsequent research into the cause, detection, prevention and management of diseases.

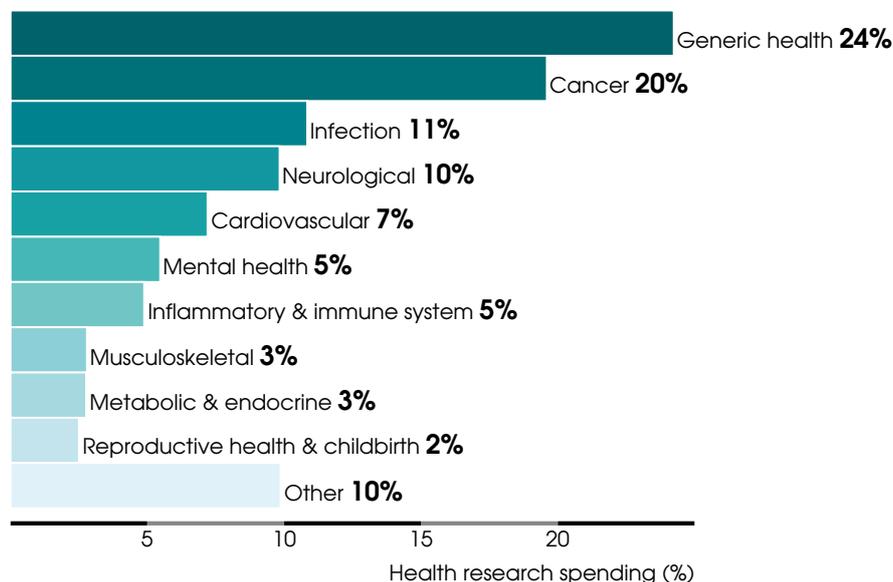
Figure 28: Proportion of health research spending by research activity in 2009/10



Source: UK Clinical Research Collaboration, UK Health Research Analysis 2009/10

Figure 29 shows the proportion of health research spending by health category, with the largest area being 'generic health relevance'. This relates to research that is applicable to all disease areas such as basic science or health services research. The proportion of research spending on cancer, infection, neurological disease and cardiovascular disease accounted for almost half of all funding in both 2003/4 and 2009/10. In 2012, UK government and medical research charities invested £544m in cancer research, £166m in CHD research, £90m in dementia research and £56m in stroke research.⁽¹⁹³⁾

Figure 29: Proportion of health research spending by health category in 2009/10



Source: UK Clinical Research Collaboration 'UK Health Research Analysis 2009/10'

One of the key criticisms was the low amount of spending on certain areas relative to the burden of disease, both in the UK and globally. One major example of this is mental health, which accounts for a quarter of all ill health in the UK and is the leading cause of disability worldwide, yet receives less than 6% of all health research funding.^(194, 195)

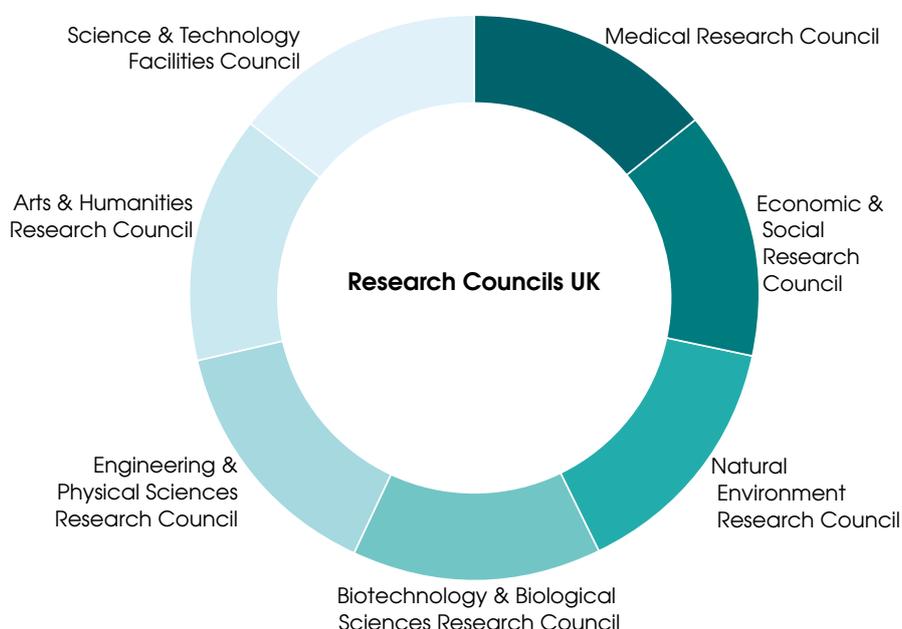
The ResIn study has looked more closely at UK research investments in infectious disease research during the period 1997 – 2010. The study team identified 6,165 studies during this period, with a total investment of £2.6bn, 35.6% of which had a clear 'global health' component (£927m). The largest disease areas were HIV with £461m (17.7%), malaria with £346m (13.3%), tuberculosis with £149m (5.7%), influenza with £80m (3.1%) and hepatitis C with £60m (2.3%). They also noted low levels of investment relative to the burden of disease for gastrointestinal disease, neglected tropical diseases (NTDs) and antimicrobial resistance (AMR). The leading funding sources identified were the Wellcome Trust (£688m, 26.4%) and the MRC (£673m, 25.8%), with significant funding from the Bill and Melinda Gates Foundation, the European Commission, the BBSRC, charities and the Department of Health for research in the NHS (now provided by the NIHR).⁽¹⁹⁶⁾

With regard to the geographical distribution of infectious disease research, the ResIn study identified that UK investments were primarily in countries with historical ties, with only 11.3% of research being in countries with no colonial links to the UK. The top 5 countries were Uganda, Zimbabwe, South Africa, Malawi and Tanzania. Basing research spending decisions on these links rather than mirroring where the relative burden of disease lies was noted to lead to neglected populations in need elsewhere.⁽¹⁹⁷⁾ Interviewees also noted the geographic gaps in UK health research as a potential weakness, with the majority of UK research overseas focused in Anglophone Africa, the Indian subcontinent and south-east Asia. However it was also noted that these are the countries where the UK has a comparative advantage due to its historical connections, and therefore represented a strategic approach.

The Research Councils' funding for health research

Research Councils UK (RCUK) is the strategic partnership of the UK's seven Research Councils as shown in Figure 30. Together, they spent £2.8bn on research across the UK in 2013/14, up from £2.1bn in 2005/6.⁽¹⁹⁸⁾ The funding contributes to international collaborations, access to facilities and infrastructure and the training and career development of researchers. The Research Councils work in partnership with other research funders, including Innovate UK, the UK Higher Education Funding Councils, business, government, and charitable organisations to maximise the impact of health research on the economy and societal wellbeing. International partnerships and collaborations are also a key part of the way they work, ensuring UK researchers are working together with leading researchers from across the world to develop the most effective solutions to global challenges in health.

Figure 30: The seven research councils that form Research Councils UK (RCUK)



The MRC, BBSRC and ESRC contribute the most to health research, and therefore will be considered in further detail together with the 'Newton Fund', a new strategic research funding partnership. In addition to these research councils, two of the six 'cross-council research' priority areas relate to health: lifelong health and wellbeing (LLHW) and global food security.

The LLHW initiative is a partnership between five research councils, focused on funding multi-disciplinary research and capacity building to work towards a healthy future for an ageing society. One example of the usefulness of cross-disciplinary working has been the ability to look at ways in which better design of the built environment can facilitate and enable mobility, physical activity and physical connectivity of older people within the community. This research will have broad implications for the design of healthy environments for older people across the world.⁽¹⁹⁹⁾

The global food security programme is a partnership between six research councils together with a broad range of UK government departments and devolved administrations and the Wellcome Trust as an observer. The goal of the programme is to work together to 'meet the challenge of providing the world's growing

population with a sustainable, safe, nutritious and affordable high-quality food using less land, with lower inputs'. The added value of cross-disciplinary working has been to improve coordination of the diverse range of specialties required to tackle this challenge, and to generate innovating approaches that lead to greater impact.⁽²⁰⁰⁾ With malnutrition the single largest contributor to disease in the world according to the UN's Standing Committee on Nutrition (SCN), this research has the potential to make a major contribution to improving health globally.⁽²⁰¹⁾

There also are a number of other strategic partnerships bringing research councils together with key partners to engage in cross-disciplinary research. One area where this is the case is emerging infections, including the Environmental and Social Ecology of Human Infectious Diseases (ESEI) initiative, looking at the way that the natural and social environments affect the emergence and spread of infectious diseases, and the Zoonoses and Emerging Livestock Systems (ZELS) initiative, looking at minimising the risk of infections transmitted from animals to humans.

MRC

The MRC is the lead Research Council on health and supports the full spectrum of health research from fundamental discovery science through to development and initial testing of new treatments or preventive measures. It also works on translational research, working with industry and public sector partners to ensure that patients reap the benefits of the UK's strong academic research base.⁽²⁰²⁾ Since being established in 1913 to study tuberculosis and other prevalent diseases of the time, the MRC has been at the forefront of medical advances including the discovery of the flu virus, the structure of DNA and the links between smoking and lung cancer and high blood pressure and heart disease. Developments in medical research have led to a shift in priorities over the years but the overriding aim of the organisation remains the same – to improve the health of people in the UK and across the world.

In 2013/14 the MRC's gross research expenditure was £845.3m, up from £766.9m in 2012/13.⁽²⁰³⁾ Between 2006 – 2013, MRC funded research has led to over 50,000 publications; the development of over 900 products and interventions; more than 379 clinical guidelines; the creation or growth of 109 companies; and 667 patents granted or published. In 2013/14 MRC discoveries and inventions generated £85.4m in licensing income.⁽²⁰⁴⁾

The MRC's five year strategic plan 'Research Changes Lives 2014-19' outlines four strategic aims that build upon the strengths and achievements of the MRC, particularly its partnerships with government departments and the NIHR, universities, research charities, industry and other partners:⁽¹⁸⁶⁾

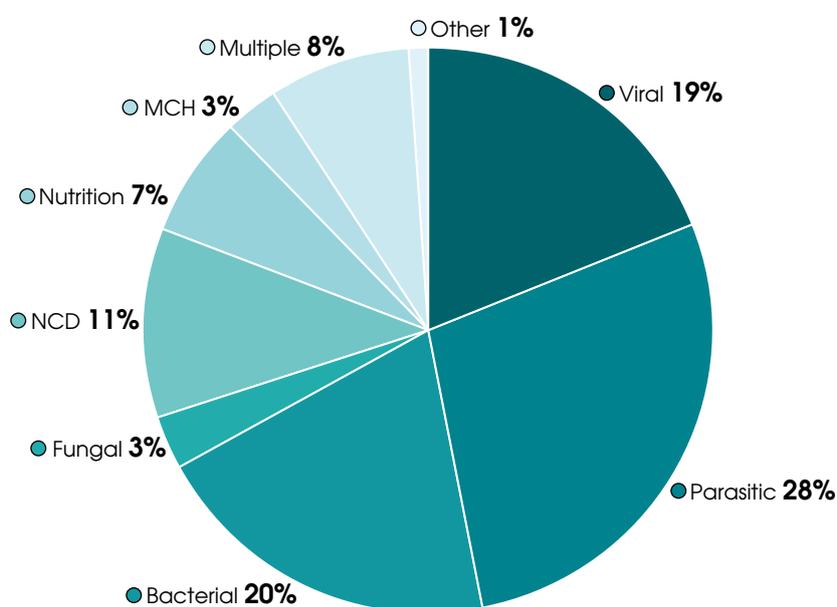
- Picking research that delivers: setting research priorities which are most likely to deliver improved health outcomes
- Research to people: bringing benefits of excellent research to all sections of society
- Going global: accelerating progress in international health research
- Supporting scientists: sustaining a robust and flourishing environment for world-class medical research

All of the research funded by the MRC contributes to improving health across the world, from work on infections and immunity, to neurosciences and mental health, to population and systems medicine. However, as indicated by the third strategic aim 'going global', the MRC have also prioritised supporting global health research that addresses the inequalities in health which arise particularly in developing countries. Spending on global health research is approximately £50m per year including a

contribution of £9m from DFID, but the MRC works in partnership with other key global health funders to maximise impact.⁽²⁰⁵⁾ This funding has led to major advances in international public health research, such as the ARROW trial in Zimbabwe and Uganda which showed that children with HIV can be safely monitored without expensive routine monitoring, reducing the cost of treatment; and the FEAST trial which showed that reviving children in shock from severe infections with fluid can have detrimental effects in resource-poor settings.^(206, 207)

Historically, the largest proportion of global health spending has been on malaria and HIV, with significant spending on TB, other infectious diseases, nutrition and maternal and child health (MCH) research. In line with the increasing burden of non-communicable diseases (NCDs) in LMICs, MRC spending on NCD research is increasing, from 5% of the total global health spend in 2012/13 to 11% in 2013/14.⁽²⁰⁸⁾ Figure 31 shows the breakdown of the MRC's global health spending in 2013/14.

Figure 31: Breakdown of MRC global health spending in 2013/14



Source: MRC, 2014

In addition to providing grant funding, the MRC also carries out global health research through its long-standing units in the Gambia and Uganda which work with local and regional networks to conduct laboratory-based research, social science studies and large-scale clinical trials. It also works through centres in the UK such as the MRC Centre for Genomics and Global Health and the MRC Centre for Outbreak Analysis and modelling which played a key role in the 2014/15 Ebola outbreak.

The MRC works through a number of strategic partnerships to carry out its global health research priorities. These include:

- The MRC-DFID concordat agreement, supporting UK-led research to tackle the priority health problems in LMICs. The 2013-2018 agreement pledges £90m to capacity development, translational and implementation research, public health research and research in health services and health systems, including large scale trials. It has also funded the African Research Leader (ARL) scheme, strengthening research leadership capacity across sub-Saharan Africa with leaders supported in Ghana, South Africa, Burkina Faso, Uganda, Kenya and Nigeria.

- The European and Developing Countries Clinical Trials Partnership (EDCTP) to support European and African collaboration on drug and vaccine trials for HIV, TB, malaria and neglected tropical diseases (NTDs).
- The Global Alliance for Chronic Disease (GACD), a partnership between health research organisations across the world, including the USA, India, China and South Africa. The GACD supports research priorities for NCDs in LMICs such as hypertension and type 2 diabetes.
- The Joint Global Health Trials Initiative with the Wellcome Trust and DFID, pooling funding and drawing on the experience of each partner to prioritise research that is likely to produce results in addressing the major causes of ill health in LMICs.
- The Joint Health Systems Research Initiative with DFID, ESRC and the Wellcome Trust, to improve our understanding of how health systems in LMICs can deliver improved health outcomes, promoting the translation of research findings to vulnerable populations.

In addition to the MRC's strategic partnerships to tackle health issues in LMICs, the MRC also takes a major leadership role in health research in Europe. Examples of this include leading the development of the Strategic Research Agenda of the European Joint Programme Initiative (JPI) on neurodegenerative diseases and leading the mapping for the JPI on microbial challenge. The MRC also leads the UK's engagement with the EU on the health aspects of Horizon 2020, the EU's research and innovation programme with over €80bn of funding available between 2014 – 2020. Further international partnerships include working with Singapore on infectious diseases; the US, China and Israel on stem cell research and regenerative medicine; and Canada on antibiotic resistance.

BBSRC

The BBSRC supports a broad range of research in humans and animals, plants, microbes and tools and technology underpinning biological research. In the area of human health, the BBSRC funds fundamental discovery science and research that seeks to develop new tools, technologies and approaches for bioscience research. This research supports innovation in the commercial sector including the pharmaceutical, biotechnology and medical technology sectors. In contrast to the MRC, the BBSRC does not fund research where the primary aim is to understand human disease-specific processes or develop associated interventions.⁽²⁰²⁾

In the financial year 2013/14, BBSRC spend on 'Bioscience for Health' was £57.5m.⁽²⁰⁹⁾ This portfolio focuses on research to improve health and wellbeing across the life course, reducing the need for medical intervention. The four key challenge areas of funding are:

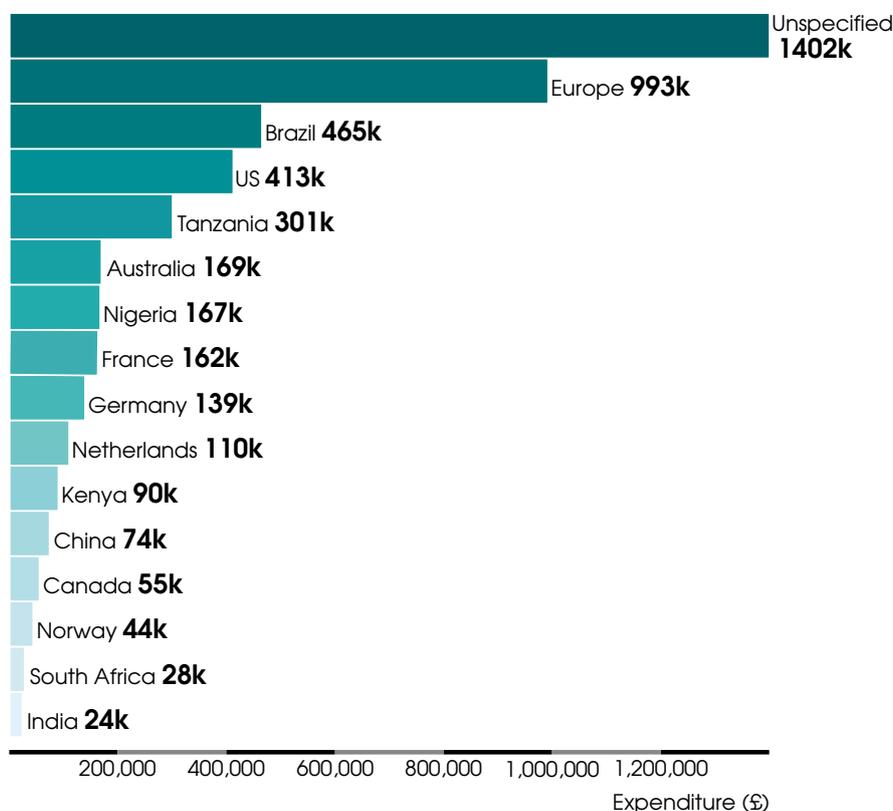
1. Lifelong health: understanding healthy ageing to promote health in later life
2. Nutrition for health: understanding how nutrition influences cellular processes and overall health outcomes
3. One health: understanding how to combat infectious diseases in animals to improve the health and wellbeing of people and animals in their environment
4. Biotechnology for health: development of enabling biotechnology to support the translation of basic bioscience into new prevention strategies, diagnostic tests and treatments

In addition to these four areas, the BBSRC's work on health includes the cross-cutting research challenges of antimicrobial resistance, and the replacement, refinement and reduction (3Rs) in research using animals. The BBSRC works in close collaboration

with key partners, including government, academia and industry to deliver on these research areas. Further examples of joint investments for health with other research councils include the UK Regenerative Medicine Platform in collaboration with the MRC and EPSRC and the joint BBSRC/ESRC initiative on epigenetics.⁽²¹⁰⁾

International programmes are also a key part of BBSRC's portfolio. These include partnering with DFID and other partners on research in LMICs; participating in European initiatives such as the ELIXIR project to develop a European life science infrastructure for biological information; and international partnerships such as the Biology of Ageing Initiative with the US National Institute of Ageing. Figure 32 shows the BBSRC's expenditure on health-related research with an international element, highlighting the scope of this work.

Figure 32: BBSRC expenditure on health-related research with an international element by country



Source: BBSRC, 2014

ESRC

The ESRC is the UK's largest funder of economic and social research in the UK, with a total budget of £213m in 2014/15. Health and wellbeing is a major area of research funding, divided into ageing, childcare, disease, healthcare, lifestyle, mental health, quality of life and welfare. These include research areas of relevance to the UK such as the UK Household Longitudinal study; areas of relevance to LMICs such as disability in developing countries; and global challenges such as AMR and dementia.

The ESRC also engages in a range of collaborations on improving health with other research councils as highlighted above, bringing social sciences expertise to tackling complex problems in health such as how to optimise health systems to deliver evidence-based interventions for the benefit of people in LMICs.

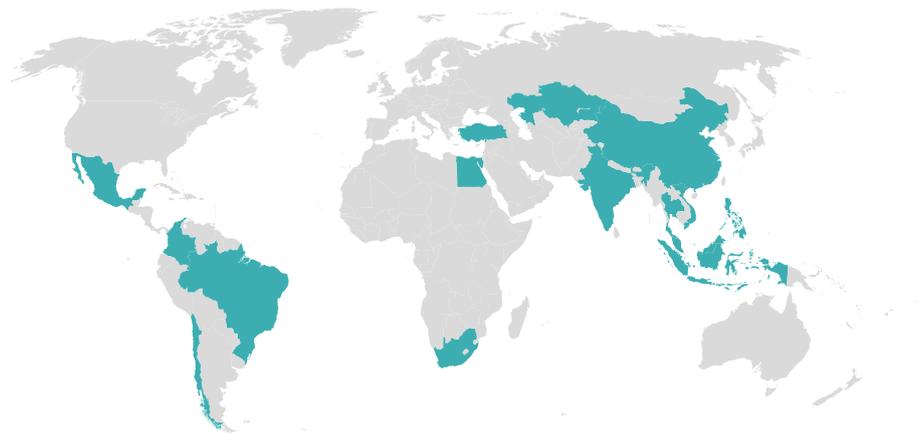
The Newton Fund

The Newton Fund is a new initiative that uses the UK's expertise to build science and innovation capacity in developing countries. It provides £375m over five years from 2014 as part of the UK's official development assistance (ODA), and is administered by the Department for Business, Innovation and Skills (BIS) with DFID involved in top-level governance. UK funding will leverage further funding from partner countries as part of the commitment to partnership, as well as aiming to generate further investment from private foundations, multilateral organisations and corporate partners. RCUK is one of the delivery partners for the fund, together with the Academy of Medical Sciences, the British Academy, the British Council, Innovate UK, the Royal Academy of Engineering, the Royal Society and the Met Office.⁽²¹¹⁾

The fund will cover three categories of activity: capacity building through fellowships, mobility schemes and joint centres; research collaborations on development topics; and innovation partnerships and challenge funds to develop innovative solutions to development topics. Health and life sciences is one of five thematic areas funded by the Newton Fund, which has already generated a significant number of research programmes.

Partner countries have been assessed to be at a stage of development beyond the need for permanent aid and are selected on the basis of being able to benefit the most from research and capacity building. They must demonstrate the ability to make use of the research for industry or sector growth, with a clear route to addressing development and poverty challenges and with the hope of producing long-term innovations in the future. The ultimate aim is to encourage research that increases employment and economic growth. There are already several funding programmes in health, including looking at neglected infectious diseases in Brazil, NCDs in Africa and Women and Children's Health in India and low-income countries.⁽²¹²⁾ The full range of partner countries is shown in Figure 33.

Figure 33: Newton Fund partner countries



Source: Department for Business, Innovation & Skills: Newton Fund: building science and innovation capacity in developing countries, 2015

The National Institute of Health Research (NIHR) and parallel bodies across the UK

The NIHR was established in 2006 to 'improve the health and wealth of the nation through research'. It is funded by the Department of Health (DH) to deliver cutting-edge clinical, public health and social care research while creating the best possible conditions for health research by the life sciences sector. To that end, it works closely with other government funders, academia, charities and industry. Since it was established, it has markedly increased the volume of applied health research in the NHS, benefiting the public through faster translation of basic science into benefits for patients and the economy. Research supported by NIHR Biomedical Research Centres and Units has resulted in the publication of over 22,000 scientific papers, and their research studies have recruited an estimated 6m patients.⁽²¹³⁾ The increased investment brought by the NIHR has been noted to have played a major role in improving the quality of health research in the UK.⁽²¹⁴⁾

In 2013/14 the NIHR spent over £1bn, including research programmes, infrastructure, developing professionals and research systems. This included funding for 13 new collaborations for leadership in applied health research (CLAHRCs) to translate research findings into improved outcomes for patients; 13 partnerships between universities and Public Health England (PHE) for health protection research; a new translational research collaboration for rare diseases; four new diagnostic evidence cooperatives to improve the diagnosis of diseases; and the new MRC/NIHR Phenome Centre to enable scientists to better understand and tackle diseases that are triggered by both genetic and environmental causes. Key areas of focus are aligned with health challenges in the UK, including dementia and antimicrobial resistance, with a strong focus on patient and public involvement in research. An example of this is the James Lind Alliance Priority Setting Partnerships (PSPs) to bring together patients, carers and clinicians to decide priorities for NIHR research.

NIHR areas of research funding cover the full spectrum of health challenges faced by patients in the NHS, and the focus on applied research ensures that research outcomes lead to tangible benefits for patients. However, research is a global public good, and once it has been conducted in the NHS the findings can be implemented in health systems across the world, contributing to improving health outcomes globally. In addition to this, NIHR engages with international partners to promote health research, for example through the Global Alliance for Genomic Health, a consortium of leading health organisations across the world dedicated to enabling secure sharing of genomic and clinical data.

In addition to the benefits to health, the NIHR makes a strong contribution to the UK economy through its collaboration with the life sciences sector and by attracting further life sciences investment to the UK, making a major contribution to the UK Life Sciences Strategy as discussed in Chapter 4. The full extent of this contribution is detailed in the NIHR 2013/14 annual report, but examples include:

- Since 2008/9, NIHR's infrastructure for experimental medicine has attracted £3.5bn of additional research investment from industry, government and charities.
- During the same period, through collaborations between industry and NIHR Biomedical Research Centres over 200 patents have been granted and over 300 licensing deals have been conducted.

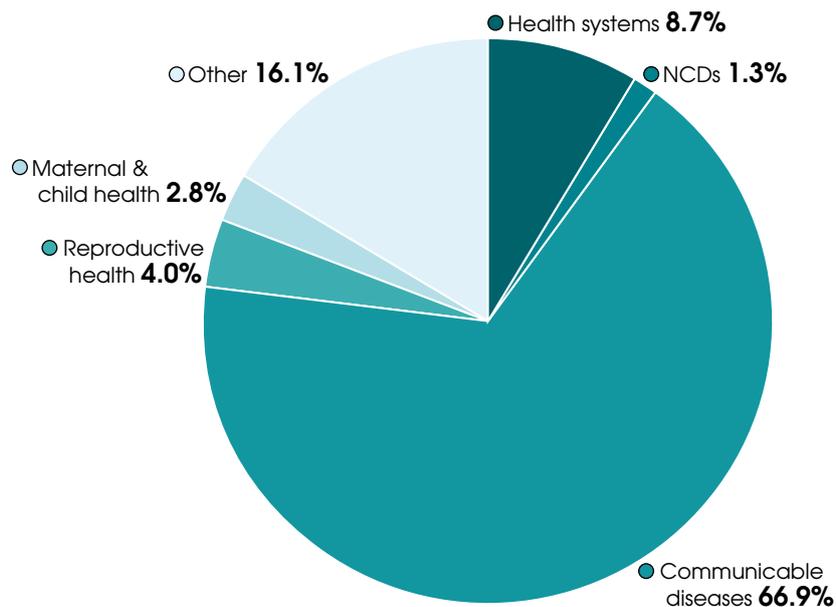
- The NIHR Clinical Research Network has provided major support to late phase industry studies, recruiting more than 25,000 patients to commercial contract studies in 2013/14 (more than five times the annual amount in 2008/9), and taking on 533 new commercial contract studies in 2013/14 (more than six times the number in 2008/9).

Research funding for the NHS in Scotland, Wales and Northern Ireland is provided by the Chief Scientists Office (CSO) in Scotland, the National Institute for Social Care and Health Research (NISCHR) in Wales, and the Northern Ireland Clinical Research Network (NICRN). The CSO has a budget of approximately £69m for 2015-16, and the R&D allocation for NHS Wales is approximately £13.4m for 2015-16.^(215, 216)

Department for International Development (DFID) research spending

DFID is a major funder of research in international development, spending approximately £325m in 2014/15, of which over £80m was spent on international health research – the largest area of spend. The UK is the second largest Government donor for international health research in the world after the USA. The breakdown of spending by area is illustrated in Figure 34, and shows that the top health areas of research funding were communicable diseases (including malaria, NTDs, TB and HIV) and health systems strengthening. Approximately 45% of funding was for the development of new health technologies and innovations to impact on poverty or the effects of poverty (e.g. diagnostics, drugs, vaccines, microbicides and insecticides), through product development partnerships (PDPs). The remainder of the funding was for research to find better and more cost-effective ways of delivering health services to those who need it, including stopping interventions that are ineffective. This was funded through a number of different mechanisms including Research Programme Consortia (RPCs), joint programmes with UK Research Councils and the Wellcome Trust and WHO-based special research programmes.⁽²¹⁷⁾

Figure 34: Proportion of DFID international health research spending by area in 2014/15 (provisional)



Source: DFID, 2015

DFID funded health research has contributed towards several major breakthroughs, including the development and use of a number of new products/technologies. This includes oral rehydration solution, insecticide treated bed nets, six new drugs for malaria, a new drug combination for sleeping sickness and new diagnostics for malaria, TB and sleeping sickness. In the field of health systems strengthening, DFID funded research has provided definitive evidence about what works and does not work, contributing to stronger health systems and improved health outcomes in LMICs.⁽²¹⁷⁾

Higher Education Funding Councils (HEFCs)

The Higher Education Funding Council for England (HEFCE) regulates and distributes public funding to the 131 universities and higher education institutions (HEIs) and 214 further education institutions (FEIs) in England, contributing to excellence in research, learning and teaching and knowledge exchange. They are the largest single source for research funds for universities in England, and provide additional teaching income for costs that cannot be covered by tuition fees. For 2015-16, HEFCE has awarded £3.97bn to universities and colleges in England. The largest proportion of this was for research in universities at £1.56bn, followed by teaching in universities at £1.3bn, with smaller amounts for capital grants (£603m), knowledge exchange between universities and industry (£160m), funding for translational research (£52m) and other areas.⁽²¹⁸⁾ Health is a significant area within this, and accordingly HEFCE makes an important contribution to health research and teaching in England. HEFCE also conducts the quality assessment of UK research including health research through the 'Research Excellence Framework' process. This is discussed in further detail below.

In the other countries of the UK, higher education funding is carried out by the Scottish Funding Council (SFC), the Higher Education Funding Council for Wales (HEFCW) and the Department for Employment and Learning in Northern Ireland (DELNI). The SFC invests around £1.6bn in Scotland's 19 universities and HEIs and 26 colleges; and HEFCW invests around £385m in higher education in Wales.^(219, 220)

Teaching and conducting research in health

Overview

Universities contribute to improving health through two major routes: through teaching and training health professionals and researchers, and through conducting health research. This section will look at the contribution of universities as well as the impact and quality of health research in the UK. In addition to universities, this section will also consider the role of the Cochrane Collaboration and think tanks in the UK.

Universities

Role in teaching and training health professionals and researchers

The UK is internationally renowned for the quality of its education and research in medicine and healthcare. The Times Higher Education (THE) World University Rankings are the only global university performance rankings that look at universities across teaching, research, citations, industry income and international outlook. In these rankings shown in Figure 35, the UK has three of the top five universities in the world for clinical, pre-clinical and health subjects in 2014-15.

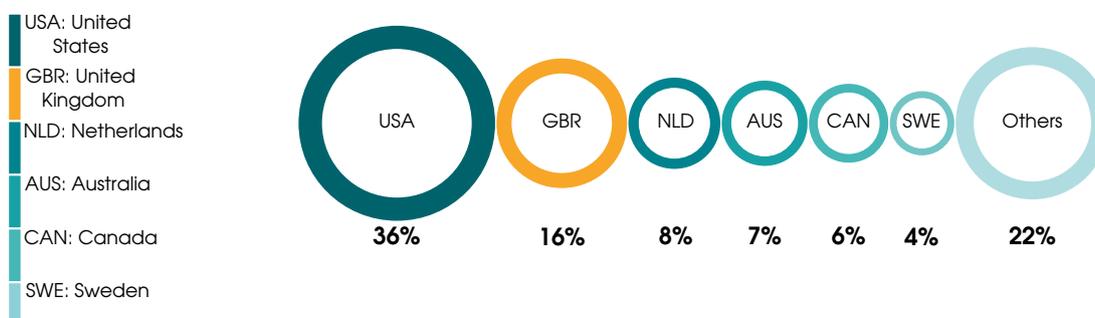
The UK also has 16 out of the top 100 universities in the world in these fields, the 2nd largest proportion after the USA.⁽²²¹⁾ The same four UK universities of Oxford, Cambridge, Imperial College London and UCL are also in the top 10 universities for world in medicine in the alternative QS World University Rankings.⁽²²²⁾

Figure 35: Top 10 universities in the world for clinical, pre-clinical and health 2014-15

Rank	Institution	location
1	University of Oxford	UK
2	Harvard University	US
3	University of Cambridge	UK
4	Imperial College London	UK
5	Stanford University	US
6	Columbia University	US
7	John Hopkins University	US
8	University College London (UCL)	UK
9	University of California, Los Angeles (UCLA)	US
10	Yale University	US

Source: Times Higher Education World University Rankings 2014-15

Figure 36: Proportion of top 100 universities for clinical, pre-clinical and health 2014-15 by country



Source: Times Higher Education World University Rankings 2014-15

Universities also play a key role in supporting the life sciences sector, discussed further in Chapter 4. One major contribution is producing life sciences graduates that go on to work in roles that contribute to innovation and growth in that sector. The UK has the 2nd highest number of science graduates after the USA, and Figure 37 and 38 show that the UK ranks 2nd in the world behind the USA in university rankings for life sciences, with 3 of the top 10 institutions.⁽²²³⁾ It also has the 2nd highest number of both total life science academic citations, and 2nd highest share of the top 1% most cited publications.⁽²²⁴⁾

Figure 37: Top 10 universities in the world for life sciences 2014-15

Rank	University	Country
1	Harvard	US
2	MIT	US
3	Cambridge	UK
4	Oxford	UK
5	Stanford	US
6	Caltech	US
7	Yale	US
8	Princeton	US
9	Johns Hopkins	US
10	Imperial College London	UK

Source: Times Higher Education World University Rankings 2014 – 15

Figure 38: Proportion of top 100 universities for life sciences 2014-15 by country



Source: Times Higher Education World University Rankings 2014 – 15

UK universities train a broad range of health professionals through the 33 medical schools, over 70 universities providing nursing education, over 80 universities offering training for allied health professionals and over 140 universities and colleges with health management courses.⁽²²⁵⁾ There were a number of key strengths of UK universities in teaching that were highlighted by interviewees. These included: a culture of scientific rigour and understanding the theoretical underpinnings of the subject; training constantly being updated to reflect the latest research and evidence; and the depth and range of skills being taught. A consequence of this was that the UK education system was viewed as producing graduates with strong skills in thinking analytically and innovatively.

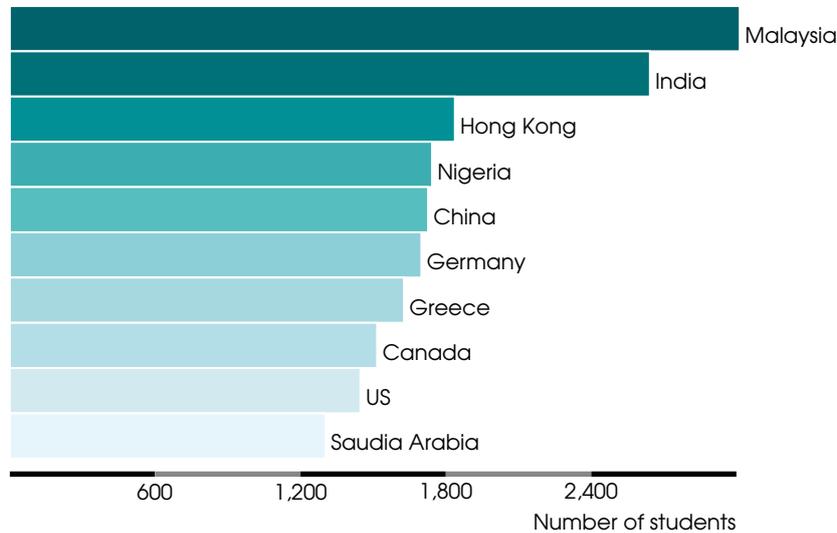
The majority of students being taught and trained in health in UK universities are from the UK, and many will go on to work and volunteer abroad, contributing to strengthening health systems outside the UK. This is discussed further in Chapter 2. However, a significant number of students are from overseas, and will return to use their skills to improve the quality of healthcare in their own countries. In addition to those students who come to the UK of their own accord, universities extend their global reach through formal partnerships to train health workers from abroad, both in the UK and in their own countries and through setting up overseas campuses.

Examples of partnerships leading to UK-based training for overseas students include Northumbria University and Shanghai University of Traditional Chinese Medicine, allowing Chinese nursing diploma graduates to attend a one-year programme at Northumbria to complete an honours degree in nursing science and progress to masters-level study; and the Iraqi Ministry of Health and Sheffield Hallam university, aiming to support the education of 75 Iraqi health professionals each year. In the opposite direction, partnerships leading to overseas-based training include the University of Northampton working with the University of Madras and DY Patil University in Mumbai to deliver courses in diabetic foot care and occupational therapy; and the School of Health at Teesside University delivering professional education in physiotherapy, occupational therapy, medical imaging and nursing to over 1,000 students in Malaysia in the last 14 years.⁽²²⁵⁾

UK universities have also begun to set up campuses overseas, extending the quality of UK higher education to students in those countries. One example of this is overseas campuses of UK medical schools, including the Newcastle Medical School campus in Malaysia and the St George's University campus in Cyprus. Another example is joint initiatives, including Imperial College London and Nanyang Technological University establishing the Lee Kong Chian School of Medicine in Singapore, playing a major role in advancing medical research through combining expertise in medicine, engineering and business. Likewise, Glasgow Caledonian University and the Grameen Trust have set up the Grameen Caledonian College of Nursing in Dhaka, contributing to addressing the shortage of trained nurses in Bangladesh.⁽²²⁵⁾ However, it was noted that the USA continues to have the largest number of overseas campuses, including medical schools, and other high-income countries are also increasing their footprint in emerging economies.

In 2014, a total of 46,670 students in the UK studying health-related disciplines were from abroad. The top 10 countries are illustrated in Figure 39, showing that the largest number of students were Malaysian, followed by India, Hong Kong, Nigeria and China.⁽¹⁸⁴⁾ The mix of nationalities of students studying in the UK leads to a strong culture of developing new ways of thinking and working through cross-cultural learning, and contributes to the strength of international collaborations seen in the UK's research output as discussed below. Interviewees also highlighted how part of the international influence and soft power of the UK stems from the fact that so many professionals were trained here, from scientists to doctors to leaders in international organisations. After they return to their countries, their first port of call when they want support is likely to be UK organisations and companies, leading to benefits for further academic collaborations, growth in UK exports of goods and services and other areas of influence.

Figure 39: Top 10 countries of residence for overseas students in health-related disciplines in 2014



Source: Higher Education Statistics Authority, 2014

However, the numbers of students coming from abroad declined between 2011 and 2012, the first time that numbers have fallen in 29 years, though they recovered in 2013 driven largely by students from south-east Asia and China.⁽²²⁶⁾ This decline has been particularly marked in students from India and Pakistan at both undergraduate and postgraduate levels, with numbers falling since 2010 and rising in other countries such as the USA and Australia, reflecting a displacement effect. Postgraduate entrants from India in 2013 were less than half the numbers enrolled in 2010. This fall in attracting the best students from abroad was described as a major threat by several interviewees, with one of the key causes noted to be the change in UK policies on visas for foreign students.

“ There’s been a lot of negative publicity in India about this government’s clamping down on visas and ‘foreign students are bad’ kind of thing. They think, okay well we’ll go to the States then. ”

Role in conducting research

The majority of UK health research is carried out in universities, though other academic units such as the Wellcome Trust Sanger Institute and MRC Institutes, Units and Centres also play a significant role. Collaborations between institutions are also increasingly important, for example the forthcoming Francis Crick Institute. This is a £650m initiative that brings together a consortium of six of the UK’s most successful biomedical science organisations: the MRC, Cancer Research UK, the Wellcome Trust, UCL, Imperial College London and King’s College London. When the Institute opens in 2016, it will employ 1,500 staff and have a budget of over £100m per year to combine the expertise in these institutions to conduct ground-breaking medical research that the Institute notes will ‘improve people’s lives and keep the UK at the forefront of innovation in medical research, attracting high-value investment and strengthening the economy’.⁽²²⁷⁾

The Research Excellence Framework (REF) is a peer-review exercise of research in UK universities that supports the allocation of quality-related funding by HEFCE and the funding bodies across the UK. It was most recently conducted by HEFCE in 2014, considering over 190,000 research outputs by over 52,000 researchers from 154 universities, grading them on a scale from 1* (recognised nationally) to 4* (world-leading). The majority of health research was classified as world leading or internationally excellent, including 81% in clinical medicine and 77% in public health services and primary care.

Universities were ranked on two measures: their 'GPA', which is a simple measure of the average quality of research submitted, taking no account of the numbers of staff submitted, and their 'research power' which multiplies the GPA by the total number of full-time equivalent staff submitted to the assessment. The results as shown in Figure 40 show that a significant proportion of research published by UK universities across all fields of health is world-leading. The top 10 institutions are listed in order of GPA, with those that would have been in the top 10 by research power included afterwards.⁽²²⁸⁾

Figure 40: Average proportion of world-leading research in the REF 2014 amongst the top institutions in each field of health research

Field of health research	Top 10 institutions by GPA or 'research power'	% of research 'world leading'
Clinical medicine	Oxford, Cambridge, King's College London, Imperial, Institute of Cancer Research, Edinburgh, Queen Mary, Cardiff, UCL, Glasgow, Newcastle and Birmingham	38-58%
Public health, health services and primary care	Oxford, Imperial, Cambridge, Bristol, Queen Mary, Keele, UCL, York, King's College London, Southampton, LSHTM, Sheffield, Aberdeen and Glasgow	36-57%
Allied health professionals, dentistry, nursing and pharmacy	Sheffield, Swansea, Southampton, Cardiff, Nottingham, Bath, Manchester, Surrey, Aston, Queen's Belfast, King's College, Strathclyde, Ulster, Lancaster and City	44-55%
Psychology, psychiatry and neuroscience	Oxford, Cardiff, Cambridge, York, Birkbeck, Royal Holloway, Imperial, Birmingham, Newcastle, Sussex, UCL, King's College London, Edinburgh, Bristol, Manchester and Nottingham	45-67%
Biological sciences	Institute of Cancer Research, Dundee, Edinburgh, Imperial, Oxford, Sheffield, Newcastle, Cambridge, York and Sussex	47-58%

Source: Jump P. 'REF 2014: results by subject'. Times Higher Education. 2014

Looking more specifically at infectious disease research where the UK was noted to have particular expertise, the ResIn study identified the key role played by UK universities. The leading recipients of infectious disease research funding are shown in Figure 41, and include both universities and other institutions such as NHS organisations and MRC institutes. The authors highlighted that the studies conducted in NHS organisations tended to be small and focused on UK health challenges, and those conducted by specialist universities such as the London School of Hygiene & Tropical Medicine (LSHTM) and the Liverpool School of Tropical Medicine (LSTM) tended to be much larger and focused on infectious disease challenges in LMICs, thus attracting a relatively large proportion of the total funding for a smaller number of studies.⁽¹⁹⁶⁾

Figure 41: Top 10 recipients of infectious disease research funding between 1997-2010

Rank	Institution	Total Funding	Number of Studies
1	Imperial College	£269.8m	539
2	Oxford University	£269.2m	490
3	LSHTM	£200.6m	295
4	All NHS	£161.3m	1192
5	UCL	£152.7m	345
6	Medical Research Council	£144.6m	89
7	Glasgow University	£121.6m	246
8	LSTM	£111.1m	74
9	Edinburgh University	£107.0m	244
10	Cambridge University	£85.4m	259

Source: Head MG, Fitchett JR, Moore DAJ, et al. Systematic analysis of funding awarded to institutions in the United Kingdom for infectious disease research, 1997–2010. *Journal of the Royal Society of Medicine*. 2015

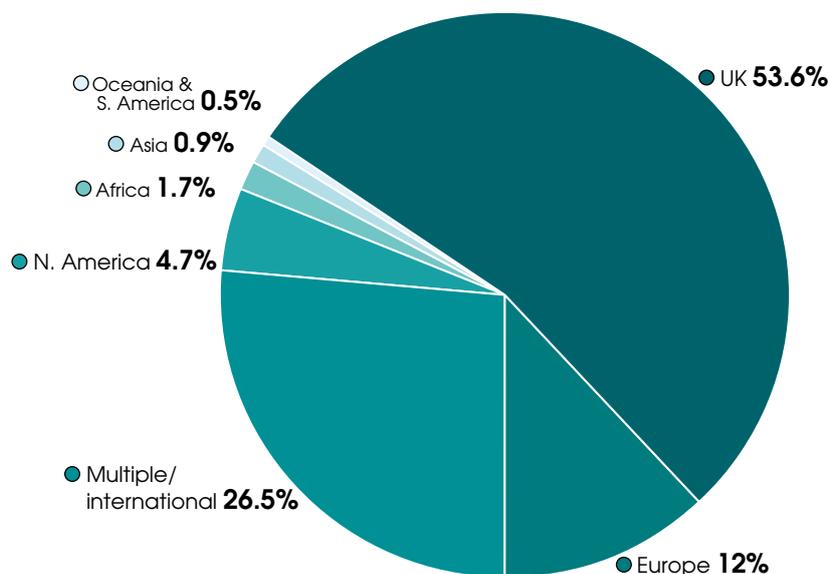
The UK also has a particular strength in health economics research, coming second to the USA and significantly ahead of Canada, the Netherlands and Sweden in publications and citations in a study published in 2012 looking at the last 40 years of research. The University of York was highlighted as one of the top 10 institutions in the world for health economics (and the only top 10 institution outside the USA), with Aberdeen, LSHTM, Oxford, LSE, Bristol, Sheffield and Southampton all in the top 50.⁽²²⁹⁾ Interviewees also mentioned basic science, clinical trials, public health, epidemiology, and health systems research as key areas of UK research expertise. However, the UK was also noted to be weak in certain areas of health research, including anthropology and behavioural sciences and how these apply to health.

Impact and quality of UK health research

It is difficult to measure the impact of research in terms of lives saved or how research has led directly to stronger health systems, though examples of research outputs that have led to major improvements in health are highlighted throughout this report. These include the impact of malaria research discussed further in Chapter 1, and the contribution of UK research to drug development highlighted in Chapter 4. Another difficulty in measuring the impact of research is the timelag between publishing research, seeing its impact and the difficulty of attribution. An example of this is the MRC funded research by Sir Richard Doll and Sir Austin Bradford Hill which provided conclusive evidence of the causal association between smoking and lung cancer, heart attacks, lung disease and other illnesses from the 1950s onwards. The reduction in the rates of smoking that were made possible through this research has saved a huge number of lives and improved health all over the world through lower rates of smoking, though directly attributing numbers of 'lives saved' is very difficult. Sir Austin is also credited with inventing the modern Randomised Controlled Trial (RCT) in medicine, one of the most significant advances in research methodology that enabled the generation of much of the high quality evidence on which modern medicine depends.⁽²³⁰⁾

The MRC publish an annual report on the 'outputs, outcome and impact of MRC research', which highlights the development of products, research materials and intellectual property as well as the influence on policy across the world. The 2013/14 report notes that recipients of 31% of MRC awards reported that their work had produced materials for others to use. These include models of mechanisms or symptoms (34%), database/collections of data/biological samples (19%), technological assays or reagents (16%), data analysis techniques (14%) and cell lines and antibodies (8%). They also reported 3,455 influences on policy between 2006 and 2013, with influence being reported in 22% of all awards. 22% of these were in the form of citation in key policy documents such as clinical guidelines, and 78% were in the form of participating in the policy setting process such as participation in an advisory committee. 46% of these policy influences took place outside the UK, with the breakdown by location illustrated in Figure 42.⁽²³¹⁾

Figure 42: Policy influence of MRC funded research between 2006 – 2013 by location



Source: MRC, Outputs, outcomes and impact of MRC research: 2013/14 report

An analysis of the REF impact case studies showed that 2,202 of the 6,679 case studies submitted were in the medical and health sciences, but an impact on health was seen in research submitted from a wide range of fields including mathematics, economics, engineering and information and computing sciences. This highlights the cross-disciplinary nature of health challenges and the strength of the UK in this regard. This research was observed to have an impact on health in 139 countries outside the UK across six continents. A full description of these case studies is beyond the scope of this report, and the impact case studies are available to view online, but three key examples are included here to highlight the contribution of UK research to improving health globally.

1. The Marmot Review

In 2008, Professor Sir Michael Marmot and his team at UCL were asked by the Secretary of State for Health to chair an independent review into the most effective evidence-based strategies for reducing health inequalities in England. This built on 20 years of work into social inequalities in health and Marmot's role in chairing the WHO Commission on the Social Determinants of Health in 2005. The 'Marmot Review' was published in 2010 and brought together a range of evidence to propose six policy objectives:

- Give every child the best start in life
- Enable all children, young people and adults to maximise their capabilities and have control over their lives
- Create fair employment and good work for all
- Ensure a healthy standard of living for all
- Create and develop healthy and sustainable places and communities
- Strengthen the role and impact of ill-health prevention

Since its publication, it has shaped public health services across the UK and around the world and guided government and international policy. The UCL Institute of Health Equity (IHE) has been set up to take this work forwards, and has been commissioned by the WHO Regional Office for Europe to provide practical guidance on policies that work to reduce inequalities in health between and within low- middle- and high-income countries; by the European Commission; and by the Pan American Health Organisation (PAHO) and others to advise on tackling social determinants of health and health inequalities around the world.⁽²³²⁾

2. The use of tranexamic acid in trauma

Traumatic bleeding kills around 2 million people worldwide every year, over 90% of these in LMICs. The CRASH-2 trial, led by Professor Ian Roberts and Haleema Shakur at LSHTM, showed that use of tranexamic acid in patients with significant traumatic bleeding reduced the risk of death from severe blood loss by one-third, with no side effects. The trial was coordinated by LSHTM and carried out within a global network of trauma hospitals, recruiting over 20,000 participants in 40 countries. The results were published in the *Lancet*, and subsequent estimates showed that implementing the use of tranexamic acid in traumatic bleeding could prevent over 100,000 deaths every year across the world – and in countries like India and China, tens of thousands of lives every year.

Following publication, a proactive advocacy campaign brought these results to the attention of international health bodies, militaries, politicians and health professionals across the world. It has now been included on the WHO List of Essential Medicines, and incorporated into trauma guidelines by the British and US armies and the NHS. As a drug that has been available for decades for use in menstrual bleeding, it is also cheap and highly cost-effective in low-, middle- and high-income countries allowing it to make a major contribution to reducing deaths from traumatic bleeding across the world.⁽²³³⁾

3. The use of new vaccines and vaccination strategies to eradicate polio

Polio is a highly contagious viral illness that mainly affects children under 5 and can cause irreversible paralysis and death. Polio cases have decreased by over 99% since 1988, from 350,000 cases in over 125 endemic countries to 416 cases in 2013 as a result of an international collaborative effort through the Global Polio Eradication Initiative (GPEI).⁽²³⁴⁾

The Vaccine Epidemiology Research Group at Imperial College, headed by Professor Nicholas Grassly, works in close collaboration with the GPEI, field and laboratory staff in polio affected countries and other international partners to carry out research that plays a critical role in guiding the work of the GPEI. This research has supported the introduction of new vaccines and guided the timing and location of vaccination campaigns. It has also played a key role in the development of the GPEI strategy, with two of the four 'major lessons' in the GPEI Strategic Plan 2010-12 being informed by Imperial research. Results from one of the clinical trials carried out by the Group was used to support a recent WHO recommendation for polio vaccination, making an important contribution to the challenge of eradicating polio once and for all.⁽²³⁵⁾

The report 'Health of the Nation: The impact of UK medical schools' research' analyses the 383 REF case studies submitted by universities with medical schools to highlight their impact. They showed that the research has an impact through four key themes: improving clinical practice, boosting the economy, delivering benefits to society and improving healthcare internationally. The latter category highlighted research from Durham University School of Medicine, Pharmacy and Health working closely with the WHO Regional Office for Europe to help design the 'European Action Plan for Strengthening Public Health Capacities and Services'; to Norwich Medical School influencing international health policy to reduce acute waterborne diarrhoeal disease, the second most common cause of death in children under 5, killing 760,000 children each year; to University of Oxford Medical Sciences Division exposing the dangerous trade in counterfeit antimalarial medication, leading to criminal investigations and arrests across the world together with interventions from the WHO and other international organisations.

A separate report that looked at a 'deep mine' of over 1,000 REF case studies showed the significant role of research in informing clinical guidelines, as well as showing that health research can generate a significant economic return on investment: for 11 case studies where researchers evidenced and monetised the actual or potential health gain arising from the underpinning research, the potential value of the net gain between 2008-2012 was crudely estimated to be around £2bn. The 'deep mine' on the impact of research on industry showed that there were significant numbers of university spin-outs, patents and licences granted in the life sciences, with 'pharmaceuticals' the second most common topic after 'technology commercialisation'. Other healthcare technologies such as 'laboratory diagnostics', 'clinical tests' and 'surgery, implants and devices' were also key topics. The 'deep mine' also showed that research in the life sciences sector (and other sectors) had an impact on BRIC countries through informing government policy; creating new technologies to develop in those countries; creating online resources for public use, facilitating international collaboration; and creation of resources and training for teaching.⁽²³⁷⁾

With regard to research quality in the UK across all fields, research commissioned by the Department for Business, Innovation and Skills (BIS) highlights that the UK punches above its weight:

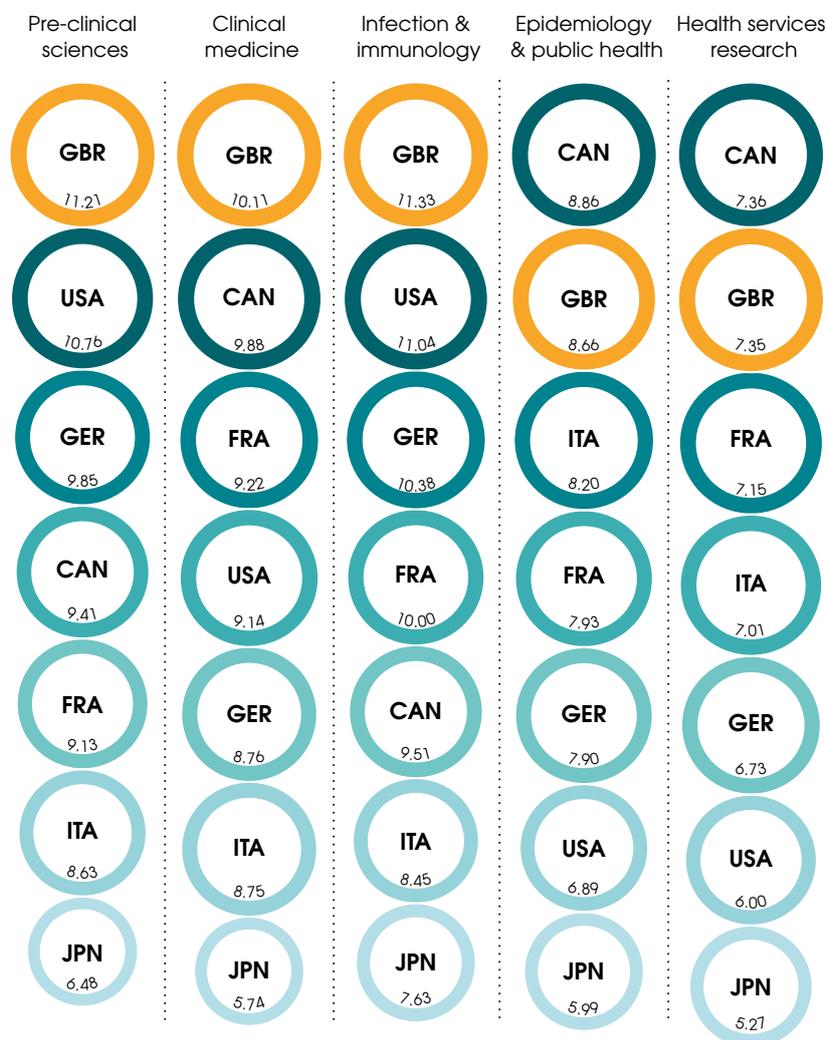
“ While the UK represents just 0.9% of global population, 3.2% of R&D expenditure, and 4.1% of researchers, it accounts for 9.5% of downloads, 11.6% of citations and 15.9% of the world's most highly-cited articles. Amongst its comparator countries, the UK has overtaken the US to rank 1st by field-weighted citation impact (an indicator of research quality). ”

*International Comparative Performance of
the UK Research Base – 2013*

With regard to international comparisons of research quality in health, the 'impact' of research corresponds to the number of times each publication has been referenced in a peer-reviewed journal. On this measure, Figure 43 illustrates that the UK is ranked top amongst G7 countries for the quality of its research in clinical medicine, pre-clinical and human biological sciences, and infection and immunology between 2010-2014, and 2nd for health services research and epidemiology and public health after Canada. Whilst the USA has the largest number of publications in all categories ahead of the UK in 2nd place, these data show that the quality of health research in the UK is higher. Interviewees also noted that the UK was a major actor in global health research.⁽²³⁸⁾

“ After the US, we have the largest critical mass certainly of researchers around global health and largest the number of people who work in developing countries directly ”

Figure 43: Research citation impact across G7 countries

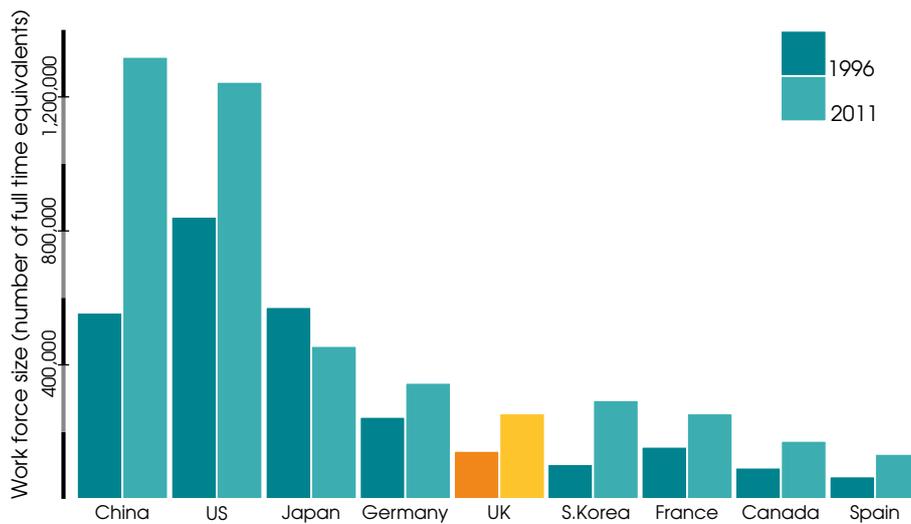


Source: InCites TM, Thomson Reuters (2012). Report Created: Jun 5, 2015, Data Processed March 18, 2015, Data Source: Web of Science (R)

The UK has the 2nd highest number of Nobel Prizes in Physiology or Medicine after the USA, including prizes in 2014, 2012 and 2010 - a key measure of sustained world-leading research over time.⁽²³⁹⁾ Another dimension to the quality of UK academia is the number of WHO Collaborating Centres hosted in the UK, based on the expertise of these academic institutions. The UK has the 3rd highest number of WHO Collaborating Centres (56) after the USA (84) and China (66), most of which are hosted by universities, though some are hosted by government bodies such as Public Health England.⁽¹⁰⁷⁾ Additionally, UK university expertise in conducting clinical trials has led to the UK hosting the 2nd highest number of clinical trials registered in the International Clinical Trials Registry Platform after the USA in May 2015 – also a key element of supporting the life sciences sector, discussed further in Chapter 4.⁽²⁴⁰⁾

However, two major threats to the UK's standing in the world were identified in terms of research output and performance. The first was the low levels of government funding in science relative to other G7/OECD countries as discussed above. The second was the science and technology workforce. As illustrated in Figure 44, between 1996 - 2011, the UK science and technology workforce increased by 3.7% annually to reach over 200,000 workers. Over the same period, USA's workforce increased 2.7% annually to reach 1.25 million workers, and China's workforce increased by 6.0% annually to reach over 1.3 million workers.⁽¹⁹¹⁾ This shows that whilst competition for highly skilled researchers continues from other G7 countries, new competition is emerging from China and other countries such as South Korea. Interviewees also highlighted major concerns over the impact of UK immigration policy on the ability to compete for the most talented applicants for these highly skilled jobs. This was noted to have consequences beyond the UK workforce, affecting the strength of the UK's academic collaborations and the ability of the UK to host international meetings, limiting its role as a global centre of academic excellence. Alongside immigration policies, it was also noted that the cost of housing and living in the UK was also a barrier to attracting and retaining talent, with a more welcoming environment for academics in North America, Australia and East Asia.

Figure 44: Size of the science and technology workforce across the world



Source: Reproduced from Moses H, Matheson D, Cairns-Smith S. The Anatomy of Medical Research, US and International Comparisons. Journal of the American Medical Association. 2015

Actors that support UK academia

Bodies such as Universities UK and the Academy of Medical Sciences support the academic sector to thrive in the UK. Universities UK is the representative organisation for all Universities in the UK, providing leadership and promoting the strength and success of UK universities nationally and internationally. The Academy of Medical Sciences was established in 1998 to improve health through research and promote benefits for society from medical science. They have six key objectives:⁽²⁴¹⁾

- Promoting excellence
- Influencing policy to improve health and wealth
- Nurturing the next generation of medical researchers
- Linking academia, industry and the NHS
- Seizing international opportunities
- Encouraging a dialogue about medical science

Through their work, they support the UK academic sector to have a much stronger influence on health globally. They work in partnership with European and global networks to influence European policy for health and research; respond to global health challenges such as AMR and climate change; and promote international mobility, collaborative working and capacity building.

Culture of collaborative working in universities

One of the key strengths of the university sector in the UK is the culture of collaborative working, which can be divided into 3 key areas:

1. Cross-disciplinary collaborations within and between universities
2. International collaborations with universities outside the UK
3. Cross-sectoral collaborations between universities and actors in other sectors

With regard to cross-disciplinary collaborations, this is of particular importance in health research because of the broad determinants of health, requiring a blend of natural sciences, social sciences, clinical medicine, mathematics, management and many other disciplines to answer complex questions. The UK was noted by interviewees to be a world leader in this area.

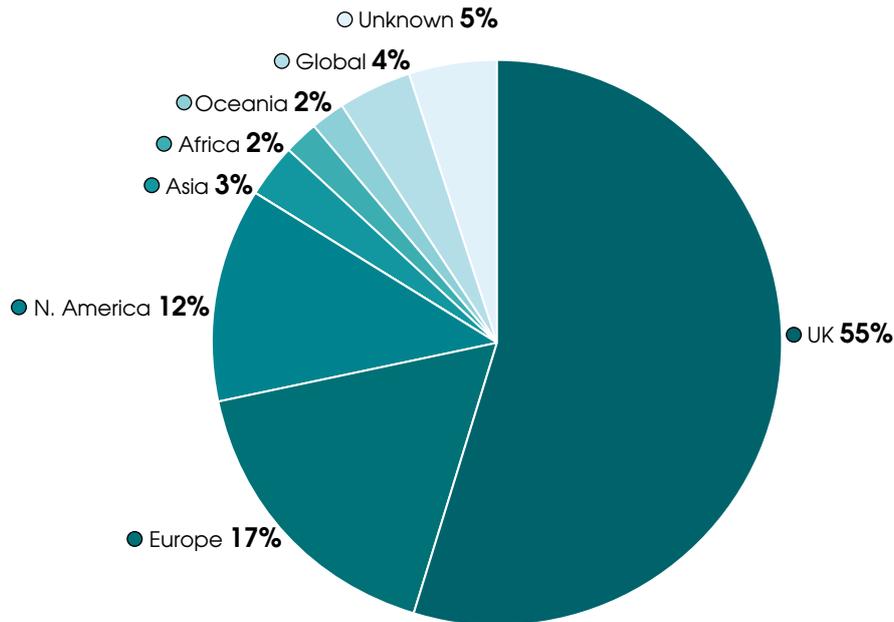
“ Only Johns Hopkins and Harvard can compare, but they are much more siloed in the way that they work. Few institutions in the world really know how to work across sectors and this is a real strength of the UK ”

One of the strongest features of the UK research environment is the proportion of research that is carried out in collaboration with international partners. The UK is noted to be a ‘focal point for global research collaboration and researcher mobility’, with this being core to its world-leading position as a research nation.⁽¹⁸⁰⁾ With regard to health, this can be seen in the number of publications with institutions from other countries. In 2013, international collaboration was a feature of 45.5% of papers in clinical medicine in the UK, compared with 31.4% in the US.⁽²⁴²⁾ Interviewees highlighted how these international collaborations led to the UK being more connected and therefore more influential internationally, both in health and beyond.

“ If you look at the last 100 Lancet papers on international health you’ll see how many of them are multi-country, and the UK has been able to have international clout because of these collaborations. ”

In addition to these partnerships, recipients of 52% of MRC awards between 2006 and 2013 reported that they had established a collaboration, with 6% of award recipients reporting at least 10 different collaborators. The majority of these collaborations were in the UK, but they extend across the world to over 100 countries as shown in Figure 45.⁽²³¹⁾

Figure 45: Geographic location of collaborations reported by MRC grant recipients



Source: MRC, Outputs, outcomes and impact of MRC research: 2013/14 report

Another aspect of international collaborations undertaken by universities and research funders is capacity building in LMICs, for example in the area of conducting clinical trials. The Academy of Medical Sciences have noted that several UK institutions have made a strong contribution to strengthening research capacity in LMICs through equitable and sustainable partnerships, including DFID, the MRC and the Wellcome Trust.⁽²⁴³⁾ They note that building strong medical research capacity can benefit countries through:

- Strengthening their role in global medical research and reducing the need for future development assistance
- Tackling local health challenges that might not otherwise be addressed by researchers from elsewhere
- Developing health solutions that are more relevant to the local context
- Strengthening local health service delivery, education and policymaking by generating and providing access to cutting edge and locally relevant evidence
- Encouraging local researchers to stay and work in their home country thereby reducing 'brain drain'
- Stimulating local life science industries and the local economy

It also benefits the UK through increasing opportunities for international collaboration. In 2011, the Academy hosted a conference on 'building institutions through equitable partnerships in global health' together with Universities UK, the Wellcome Trust and the Gates Foundation. They noted that there had been an expansion in the number and type of partnerships that the UK had engaged in. These included traditional north-south partnerships such as the KEMRI Wellcome Trust Research Programme (KWTRP) in Kenya and the Mahidol Oxford Tropical Medicine Research Unit (MORU) in Thailand; south-south partnerships such as the Wellcome Trust African Institutions Initiative (AII); and several other models.⁽²⁴⁴⁾

The AII programme was launched in 2009 to build a critical mass of sustainable research capacity across Africa through strengthening African universities and research institutions. The unique features of the model are that it is an African-led programme that is highly networked and focuses on building both individual and institutional capacity. It doesn't aim for quick wins, instead laying the foundations for increased research capacity and the emergence of locally relevant health agendas over time. The evaluation of the first four years showed that successes were already evident, and that the consortia were contributing in multiple ways to developing sustainable research capacity.⁽²⁴⁴⁾ More recently, the Alliance for Accelerating Excellence in Science in Africa (AESAs) has been launched to give African scientists even greater control over the research that takes place in their countries.

The Alliance for Accelerating Excellence in Science in Africa (AESAs)

DFID, the Wellcome Trust and the Gates Foundation are supporting the African Union's recent call to establish the AESAs which will be led by the African Academy of Sciences and the New Partnership for Africa's development. This will create a regional hub to award grants and develop research capacity, with the Wellcome Trust transferring the management of millions of dollars in research funds to the Alliance using a phased approach. The model aims to leverage additional funds from international donors and governments in Africa, increasing the funds available to African scientists to direct their own research.

This will make a significant impact on shifting the gravity for African funding decisions to the continent, whereas until now they have always been made by research funders in high-income countries. This has had the consequence of limiting the impact of research through poor coordination of funding priorities and need – with donor countries providing funding to their own 'priority countries' and 'priority diseases' rather than reflecting the needs of people on the continent. To support this shift, AESAs will also act as a think-tank to identify future research needs and priorities. This initiative represents the most significant shift towards sustainable, Southern-led research funding to date.⁽²⁴⁵⁾

With regard to inter-sectoral collaboration, one example of this is the strong culture of collaboration with industry partners and the NHS to support the commercialisation of health technologies and the adoption and diffusion of these into the NHS. This is described in detail in Chapter 4.⁽²⁴⁶⁾

The Cochrane Collaboration

The first Cochrane Centre was opened in Oxford in 1992 under the leadership of Iain Chalmers, named after the Scottish doctor Archie Cochrane who advocated for the use of randomised controlled trials (RCTs) to improve the effectiveness of healthcare. Its purpose was to carry out systematic reviews of RCTs ('Cochrane Reviews') to ensure that up-to-date, accurate information about the effects of healthcare interventions was readily available to the NHS.⁽²⁴⁷⁾ These are recognised as the gold standard of evidence in healthcare, providing accessible, credible information to health professionals, policy makers, patients and carers.^(248, 249) Cochrane reviews are free from commercial sponsorship or other conflicts of interest, enhancing their credibility.

Soon after the opening of the first Cochrane Centre, work began to create a global network of collaborators to increase the availability of Cochrane Reviews and bring the benefits of evidence-based healthcare to the whole world. Today, the Cochrane Collaboration is a network of tens of thousands of volunteers in over 120 countries, all working to provide evidence to help people make decisions about healthcare.⁽²⁴⁹⁾ Cochrane UK is one of 41 regional centres and branches, funded by NIHR and hosted by Oxford University Hospitals NHS Trust. The UK continues to have the highest number of contributors to Cochrane Reviews in the world.⁽²⁵⁰⁾

Cochrane Reviews are published in the journal 'Cochrane Database of Systematic Reviews' (CDSR), which contains over 8,700 systematic reviews.⁽²⁵¹⁾ The quality of the reviews is indicated by the CDSR having the 10th highest impact factor of all medical journals in the world in 2013.⁽²⁵²⁾ The 'Strategy to 2020' highlights the importance of not only producing quality evidence, but also making it accessible and useful to everybody, everywhere in the world and advocating for evidence-based healthcare globally.⁽²⁵³⁾ In line with this, there has been significant progress towards global open access to Cochrane Reviews, with free access for over 100 LMICs and free access for all countries after 12 months. A study on the impact of Cochrane Reviews showed whilst the health and economic impacts of research are difficult to measure, Cochrane Reviews have a significant impact on policy: of 1,502 new and updated reviews between 2007-11, 483 reviews were cited in 247 sets of guidance across the world and qualitative data showed that they played an instrumental role in informing guidance. They also noted impacts on clinical practice, including the safer use of medication, identification of new effective treatments and reduction in the use of unnecessary procedures or unproven procedures.⁽²⁵⁴⁾

Together with a range of other databases that contain different types of high-quality evidence, the CDSR forms part of the Cochrane Library that supports evidence-based decision making in healthcare. Plain language summaries are also available to ensure that this information is accessible to all, and the 'Cochrane Consumer Network' incorporates patient perspectives into the review process, putting them at the centre of the drive for evidence-based medicine. In order to extend the accessibility of this evidence, translations of these summaries are also made available in a number of languages.

Cochrane also supports the use of evidence-based healthcare in natural disasters and humanitarian emergencies through Evidence Aid. As the primary source of systematic reviews for Evidence Aid, the Cochrane Collaboration provides evidence for broad range of topics relevant to these settings, as well as publishing 'special collections' including: burns; post-traumatic stress disorder; flooding and poor water sanitation; and earthquakes.⁽²⁵⁵⁾ Cochrane is also making a major contribution to capacity building in LMICs, developing the expertise to understand evidence and carry out systematic reviews, engage with different professional and patient groups, use evidence to improve health services and ultimately to increase the quality of healthcare across the world.⁽²⁵⁶⁾

Think Tanks

Think Tanks perform a key role in research and shaping policy, and there are a number of internationally respected think tanks in the UK that make an important contribution to influencing the health policy debate globally. These include Chatham House, the Overseas Development Institute (ODI), the Institute of Development Studies (IDS) and the Cambridge Centre for Health Services Research.⁽²⁵⁷⁾ In addition to these globally focused think tanks, the UK also has highly influential think tanks focused on domestic health policy, such as the King's Fund and the Nuffield Trust, and others that include domestic health within their portfolio, such as Civitas and Reform. Whilst they are not considered further in this report, the research and policy reports published by these think tanks also contribute to the policy debate around improving healthcare in other OECD countries, particularly in Europe.

Chatham House

Chatham House is an independent think tank established in 1920, engaging governments, the private sector and civil society in over 300 events every year, including open debates and confidential discussions on important developments in international affairs. It is globally respected, being assessed by the annual Global Go To Think Tank Index as the top think tank outside the US for seven consecutive years and the number 2 think tank in the world for the past four years.⁽²⁵⁸⁾

In 2009, it established the Centre on Global Health Security to examine key global health challenges and how they manifest themselves as foreign policy and international affairs problems. These include disease threats and determinants that transcend borders such as pandemic flu and the Ebola outbreak; access to health-related products, technologies and services such as equitable access to HIV drugs and flu vaccines; and international affairs, governance and health, including how efforts to improve global health serve foreign policy interests such as security and economic growth. The Centre has made significant contributions to the policy debate around a broad range of areas in global health, including universal health coverage and the Post-2015 Development Agenda, antimicrobial resistance and strengthening data sharing for public health.⁽²⁵⁹⁾

“ Chatham House is a great source of expertise, a unique source of expertise, because it brings together people who have been very actively involved in policy development but from a professional health security point of view... there's an essential need for an independent research analysis and policy development think-tank. ”

Overseas Development Institute (ODI) and the Institute of Development Studies (IDS)

The ODI and the IDS are two of the leading international development think tanks in the world, and make major contributions to the policy debate around improving health in low and middle income countries. The ODI was founded in 1960, and works together with partners in the public and private sector to produce high quality applied research, practical policy advice and policy-focused dissemination and debate. Key recent reports on global health issues include: 'Global mental health from a policy perspective', looking at why mental health is frequently overlooked by policy-makers and approaches to improving levels of policy traction, financing and public support; and 'Future diets: implications for agriculture and food prices', looking at the implications of changing diets and rising obesity globally and ways of tackling this.

The IDS, based at the University of Sussex, was founded in 1966 and brings together researchers and staff from a wide range of disciplines to deliver research knowledge that is a blend of political, scientific, economic and social analysis. One of its 'research clusters' is health and nutrition, with a focus on bringing a critical social science perspective to how people, especially the poor, address their health and nutrition-related needs and on how governments and other groups influence the performance of these sectors. They look at a wide range of issues including Ebola, animal-to-human disease transmission, health systems, agriculture and nutrition and provide direct support to DFID to support their work in health and nutrition. They also host the secretariat for the Global Nutrition Report, a major initiative in improving global accountability for nutrition and making a unique contribution to efforts to reduce malnutrition across the world.

Cambridge Centre for Health Services Research (CCHSR)

CCHSR is a collaboration between two leading healthcare research groups: the Health Services Research Group at the University of Cambridge, and the Health and Healthcare Group based at RAND Europe. It was ranked the top global health policy think tank in the world in 2014.⁽²⁵⁷⁾ Its mission is to inform policy through evidence-based research on health services, both in the UK and internationally. Its three key research areas are: international comparisons and policy development, encouraging cross-country learning to inform policy development; evaluating initiatives to improve the quality of healthcare; and developing methods of measuring the quality of healthcare. Work in these areas contribute to the healthcare policy debate across the world, but the learning is also applied to improving the quality of healthcare in the UK. Examples of this include the development of quality indicators for the UK Quality and Outcomes Framework (QoF) and the national GP Patient Survey, sent to 2.7 million NHS patients every year.

Medical journals and the dissemination of research

The UK is home to a large number of health journals, including three of the oldest and most prestigious journals in the world: the Lancet, the British Medical Journal (BMJ) and Nature. These journals have been peer-reviewing, publishing and disseminating high quality medical and life sciences research for over 150 years, and have also engaged in advocacy on domestic and global health issues, raising the standard of the debate across the world. They also make their research and reviews available to low-income countries for free or low cost through the HINARI programme.⁽²⁶⁰⁾ This was set up by the WHO together with major publishers to enable access to over 13,000 journals for over 5,000 institutions in more than 100 LMICs.⁽¹¹³⁾

In addition to the core journals, these journal groups now publish a range of specialist titles, developing both the breadth and depth of published medical research. These include some of the official journals of the medical royal colleges, for example the BMJ Group publishes the Archives of Diseases in Childhood, the official journal of the Royal College of Paediatrics and Child Health. In addition to these three major journal groups, the UK also publishes a range of other internationally recognised journals. These include BioMed Central which publishes 279 peer-reviewed open-access journals, and journals of some Royal Colleges such as the British Journal of General Practice (BJGP) as discussed in Chapter 2.⁽²⁶¹⁾

The Lancet

The Lancet was established in 1823, and today has the 2nd highest impact factor amongst medical journals across the world after the New England Journal of Medicine (NEJM).⁽²⁴⁶⁾ Since its inception, it has published original research articles alongside editorials, letters, reviews and case reports, disseminating peer-reviewed medical research globally. The Lancet Journals today include 11 titles, covering specialties such as neurology, oncology, infectious diseases, HIV and psychiatry, as well as 'The Lancet Global Health', an online-only open access journal focused on health in LMICs.

The Lancet is also one of the leading medical journals publishing on health issues that affect populations in LMICs, as well as cross-disciplinary approaches to health issues that transcend borders. Examples of this include Lancet series' on health and climate change, trade and health, violence against women and girls, maternal and child nutrition and many others. It also publishes global health themed issues and country analyses. These have made significant contributions not only to strengthening the evidence base for improving health, but also to raising the profile of important issues in global health and advocating for progressive change.

The Lancet's contribution to global health also includes the Lancet Commissions, aimed at catalysing political action on important health challenges. The Lancet Commission on Global Surgery has highlighted the disparity between the global burden of disease amenable to surgical intervention and access to safe surgical care worldwide. Prior to this the Lancet-University of Oslo Commission on Global Governance for Health examined the political origins of health inequity that require improved global governance, and the Lancet Commission on Investing in Health revisited the case for investment in health and developed a new investment framework to achieve dramatic health gains by 2035. In addition to publishing quality scientific research, the Lancet's approach of using science for advocacy and as an accountability mechanism to hold actors to account for their promises is central to its contribution to improving health globally.

The BMJ

The BMJ was first published in 1840, and today has the 4th highest impact factor amongst medical journals across the world after the NEJM, the Lancet and the Journal of the American Medical Association (JAMA). The BMJ Group publishes over 50 of the world's leading medical and health science journals, including the international medical journal for students. They have a global reach with over 300,000 customers worldwide, publishing in 10 languages and producing specialist publications for 19 countries including Brazil, India and China.⁽²⁶²⁾

The BMJ has made a strong contribution to pushing forwards the debate on integrity in both health research and clinical practice. This includes campaigns on research fraud and misconduct, patient participation and their campaign on transparency and open data. The BMJ was one of the first journals to require sharing of anonymised patient data for trials of drugs or devices, a policy which they have extended to all clinical trials as of July 2015.⁽²⁶³⁾ With regard to integrity in clinical practice, one area where the BMA is pushing the debate is the 'Too much medicine' campaign which aims to highlight the threat to human health from overdiagnosis and the waste of resources on unnecessary care. They have also focused on health issues in LMICs such as their 'Corruption in healthcare' campaign, raising the profile of corrupt practices in health systems internationally, starting with India, and pushing for change.⁽²⁶⁴⁾ One of their major strengths of the BMJ is its 'investigative journalism' approach to uncovering issues in health internationally, providing a unique perspective amongst medical journals to health issues that affect us all such as drug development.

In addition to the BMJ's global footprint through the journal, it also delivers a wide range of products and services to tackle critical healthcare challenges, including BMJ Learning, a comprehensive online learning resource used by health professionals across the world including India, China, Brazil and Scandinavia. The BMJ also plays a key role in improving quality in healthcare and patient safety across the world through organising the International Forum on Quality and Safety in Healthcare with the Institute of Healthcare Improvement (IHI) which is based in Massachusetts. This brings together over 3,000 attendees from around 80 countries every year to meet, learn and share their knowledge on improving quality and safety for patients. ⁽²⁶⁵⁾

Conclusions

Contribution of the academic sector to improving health and shared prosperity across the world

1. **The UK academic sector contributes to improving health across the world through:**
 - a. Research funders including the Research Councils, NIHR, the Wellcome Trust and DFID's research and evidence department working together to prioritise and fund research to tackle the full spectrum of health challenges, both today and in the future. This includes NCDs such as cancer, heart disease and mental health in different country contexts; infectious diseases such as HIV, malaria and TB as well as AMR; and health systems research. Together with universities, the Cochrane Collaboration and Think Tanks, they also engage in capacity building of researchers, supporting the next generation of leaders in health research in the UK and in LMICs.
 - b. Universities carrying out health research, from early stage discovery science to late stage translational research. This research has an impact on health through improving clinical guidelines and broader policy shifts including the social determinants of health; the development of new drugs and diagnostics that improve people's health; and other routes. Universities also engage in the training of health workers and researchers, both in the UK and through partnerships and overseas campuses. This makes a strong contribution to strengthening health systems across the world as well as increasing the global research base.
 - c. The Cochrane Collaboration generating high-quality systematic reviews of evidence to support healthcare decision makers to treat patients more effectively and minimise harm.
 - d. Think Tanks including Chatham House, ODI and IDS convening experts from across the public, private and not-for-profit sectors to push forwards the debate on health issues and conducting policy focused research to influence the health policy debate globally.
 - e. Internationally respected journals including the Lancet, the BMJ and Nature publishing and disseminating high quality research, supporting informed decision making by healthcare workers across the world. They also make a major contribution to improving health globally through engaging in advocacy and holding actors in health to account for their commitments.

2. This activity contributes to health and prosperity abroad, but also benefits the UK population through:

- a. The impact of research on improving health in the UK through a better understanding of treatment and prevention of disease, leading to improved health outcomes in the NHS today. Research in the UK is also supporting the development of future technologies including regenerative medicine, genomics and precision medicine that NHS patients will be amongst the first in the world to benefit from.
- b. The economic benefits of health research through better prevention of illnesses (e.g. through reducing smoking rates) and more effective management that reduces disability and deaths from disease (e.g. through better treatments). Cancer research has led to a 40% annual return on investment to the UK, cardiovascular disease a 39% return and mental health research a 37% return.
- c. Generating significant high-skilled employment in the UK that also supports employment in other sectors. In addition to the employment generated by domestic investment, the UK's position as a global leader in health research attracts international funding that further increases employment in this sector.
- d. Training high-quality healthcare workers who go on to work in the NHS, benefiting from cross-cultural-learning from students from around the world and teaching from some of the best academics in the world who come to the UK to develop their careers. This makes a critical contribution to the high quality of care in the NHS.
- e. Training healthcare workers and scientists from abroad who return to work in their home countries, but retain links with the UK academic, commercial and state sectors, leading to relationships that benefit the UK in the future. The links forged through teaching and training students from around the world that go on to be leaders in their own countries are an important component of the UK's soft power and the high regard in which it is held around the world.
- f. Supporting the life sciences sector through working collaboratively with industry and the NHS, carrying out early and late-stage research that have the potential to improve people's health. The academic sector also supports the life sciences sector through supplying a highly skilled workforce.

The academic sector's weaknesses and vulnerabilities with regard to its contribution to improving health and shared prosperity across the world

1. **Certain weaknesses were identified that currently limit the contribution that the academic sector can make, including:**
 - a. A mismatch between the proportion of research funding available for different disease areas and the burden of ill health and deaths caused by those diseases. Mental health accounts for approximately a quarter of all ill health in the UK and is the leading cause of disability worldwide, yet receives less than 6% of all health research funding. Funding for NCD research in LMICs is increasing, but is still a small proportion of total funding in relation to the present and future challenge of NCDs in these countries.
 - b. A mismatch between the geographic focus of health research and the distribution of the burden of disease across the world. UK research activities are focused on Anglophone countries and those with historic links, neglecting other areas with a significant burden of disease. These include Francophone and Lusophone countries in sub-Saharan Africa, as well as South America and central Asia. However, the UK has a comparative advantage in the countries in which it funds research due to these language and historic links, increasing the effectiveness of the available research funding.
 - c. A relative weakness in certain academic disciplines that contribute to understanding health, including anthropology and behavioural sciences.
2. **Additionally, looking ahead there were also threats that were identified to the academic sector's ability to continue to take a strong role in health globally, including:**
 - a. The low levels of government funding for research across all sectors, with UK spending on R&D as a percentage of GDP the lowest in the G8. The amount of funding from commercial sources for university research has also been falling since 2006. With countries around the world investing strongly in research, without increasing spending domestically it was noted that sustaining the UK's world-leading position in research will be challenging.
 - b. Immigration policy and the high cost of living which has led to a fall in the number of students, experienced researchers and world-leading academics coming from overseas. At the same time there is increasing international competition in academia, with other countries offering a more welcoming environment, setting up overseas campuses and partnerships and reaching out to attract the best global talent in health. This has led to a difficulty in recruiting and retaining the best students and the most talented academics that threatens the UK's reputation as a global centre of research excellence and the health and economic benefits that flow from this.

The strengths and potential for growing the contribution of the academic sector to improving health and shared prosperity across the world

1. **The strengths of the UK academic sector that enable it to effectively contribute to improving health across the world include:**
 - a. Internationally influential institutions, including research funders such as the MRC and the Wellcome Trust; globally recognised think tanks such as Chatham House, the ODI and the CCHSR; and world-leading medical and bioscience journal groups including the BMJ, the Lancet and Nature. These have a significant influence on health policy and moving the health agenda within Europe and across the world. International links through partnerships, collaborative working and overseas university campuses extend the reach of this influence.
 - b. World-leading universities, with three of the top five universities in the world for clinical, pre-clinical and health and two of the top five universities in the world for life sciences, as well as the 2nd largest share of the top 100 universities in the world for both behind the USA. The UK also has particular strengths in health economics, public health, tropical medicine and clinical trials, hosting the 2nd highest number of clinical trials in the world after the USA. The strength of these universities is illustrated by the quality of their research output, with 36-67% of health-related research in the top 10 institutions being classified as 'world leading', and the UK ranking 1st or 2nd in the world for research quality by citation impact in health-related fields. It is also illustrated by the UK hosting the 3rd largest number of WHO Collaborating Centres after the USA and China, most of which are in universities.
 - c. A broad range of domestic funding sources for health research, including the life sciences industry; medical research charities; the Wellcome Trust; and government funding including the NIHR, Research Councils, Higher Education Funding Councils and other sources. The strength of the UK research environment has also led to significant external funding, including being the largest recipient of health research funding from the EU and the 2nd largest from the Bill and Melinda Gates Foundation.
 - d. A strong culture of collaborative working across the whole academic sector that brings together different perspectives from around the world and across disciplines to tackle complex problems in health research. This includes both universities and research funders collaborating with domestic and international partners to bring together global expertise in health; cross-disciplinary collaborations between the different Research Councils and universities; and commercial partnerships that accelerate the translation of health research into medicines and healthcare technologies that benefit patients. The development of the Crick Institute highlights the UK's commitment to collaborative working going forwards.
 - e. A strong focus on health in LMICs, with the UK the 2nd largest government donor of international health research through DFID, and the MRC and Wellcome Trust funding significant research programmes in international health. This includes both directly carrying out research on health challenges in LMICs and supporting capacity building for research at the individual, institutional and systems level in LMICs.

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2. **Building on these strengths and looking ahead, there are several opportunities to grow the contribution of this sector to improving health across the world, including:**
- a. Capitalising on the shift away from international funding for domestic health systems in LMICs and towards global public goods for health such as research. In this context, the UK has a major opportunity to build on its existing expertise and strong international collaborations to attract further funding and grow as a global centre for health research.
 - b. Catalysing the rebalancing of the relationship between HICs and LMICs away from 'parachuting in' academics and towards developing in-country capacity and leadership in teaching and research. The UK has taken a lead role in supporting this shift, for example through programmes undertaken by the MRC, the Wellcome Trust and the Newton Fund and through universities setting up overseas partnerships and campuses. It is accordingly well placed to build on this to ensure that countries have the capacity to tackle the health challenges that face them domestically, and to build more equal partnerships to work together on the health challenges that face us all. However, a consequence of this shift was noted to be that students and junior staff in the UK are finding it more difficult to get the field experience in LMICs necessary to support this shift.
 - c. Building on the strong culture of collaborative working between disciplines and across sectors and learning lessons from the Ebola outbreak which showed that much stronger links were possible and indeed required for an effective response. Forging even closer collaboration between disciplines and sectors is likely to result in the development of more effective solutions to health challenges that face us all.

4. The Commercial Sector

What do we mean by the 'commercial sector'?

The private 'for-profit' sector, or 'commercial sector' as it is described in this report, includes profit-making companies that sell goods and services. This report distinguishes between actors whose core business is directed at improving health which are included – 'health' industries, and those whose core business is not directed at improving health but may nonetheless have an impact on health which are excluded – 'non-health' industries.

With regard to 'health' industries, this includes the 'healthcare' and 'life sciences' sectors. The healthcare sector includes companies that contribute to building and staffing a health system, whereas the life sciences sector includes companies that are engaged in the R&D, manufacture and distribution of pharmaceuticals, biotechnology and medical technologies.

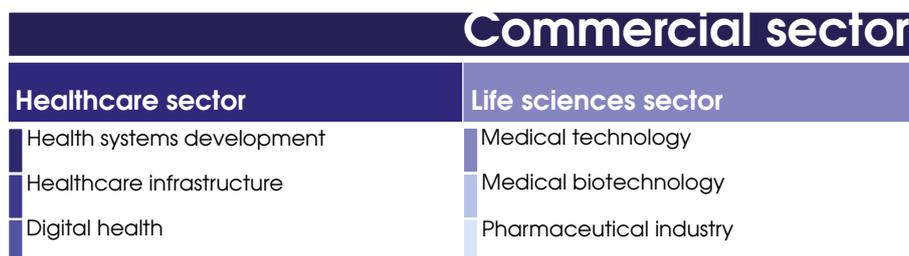
With regard to 'non-health' industries, this includes companies that produce goods and services that affect risk factors for health, such as the food, alcohol, and tobacco industries, and those that impact upon the social determinants of health. As the social determinants of health include income, employment and labour practices, all UK commercial actors with activity or supply chains abroad will have an impact on people's health across the world. Financial institutions through their investments in health promoting and health damaging industries across the world also have a significant impact on health.

Accordingly, whilst the focus of this chapter is on companies whose core business is directed at improving health, it is important to keep in mind that this is only part of the picture. A full mapping of the contribution of the UK commercial sector to health globally, were the data available, would be a much more complex undertaking, undoubtedly with quite different conclusions. In keeping with the focus on 'core business', corporate philanthropy or corporate social responsibility (CSR) activities are also excluded from the scope of this report.

Outline of chapter

As shown in Figure 46, the commercial sector has two main areas. This chapter will consider each of these in turn, beginning with the UK 'healthcare' sector and then moving onto the UK life sciences sector. For each sector, the chapter will first describe the role that it plays in improving health before mapping its global footprint. For the life sciences sector, the chapter will cover the broad range of ways in which the state and academic sectors support innovation and growth in the sector and some of the challenges in this area. Finally, the chapter will conclude by bringing together the contribution of the commercial sector to improving health and shared prosperity across the world, as well as the challenges and opportunities looking to the future.

Figure 46: Outline of the commercial sector



The commercial 'healthcare' sector

Overview

The commercial sector is concerned with the development and sale of products and services to improve health care and preserve or promote health. It is very diverse, reflecting both the diversity within the sector and rapid expansion of the whole sector globally. The commercial healthcare sector in the UK is a major employer and a major contributor to the UK economy - and there are significant opportunities opening up as the global market expands. Healthcare is the world's largest industry with a value three times greater than the banking sector, and a major priority for governments across the world, consuming an average of 10.5% of GDP globally in 2014.^(266, 267) Whilst the majority of this is domestic spending by countries themselves, the UK is a major global actor in supporting other countries to deliver improvement in their health systems.

Globally, healthcare spending is also increasing as countries such as India, China, Indonesia and the Philippines seek to reach the goal of universal health coverage (UHC); middle-income countries that have already achieved UHC such as Brazil seek to improve the quality of their services; and other regions such as the Middle East increase their spending markedly.⁽²⁶⁸⁾ Between 2014-17, global healthcare spending is projected to rise by 5.2% per year, with the fastest growth in the Middle East and Africa at 8.7%, Asia-Pacific at 8.1%, Latin America by 4.6%, North America by 4.9% and Western Europe at 2.4%. India and China are expected to see rapid growth of 15.2% and 12.5% annually.⁽²⁾

For the most part there is synergy between the twin goals of leading the way on improving health worldwide and building ever more successful and effective life sciences industries with, for example, UK research supporting new developments of worldwide benefit and working with industry to find ways to translate them into commercial products. However, it is worth noting that there are occasions when there are tensions between the two because of differing priorities, making it essential for the Government to be clear when it is acting in global solidarity and when it is supporting commercial goals.

Healthcare UK, the government body set up to promote the UK healthcare sector to overseas markets, includes the following sub-sectors as 'healthcare industries':

- **Health systems development:** The design and delivery of improved health systems that underpin the delivery of quality healthcare.
- **Healthcare infrastructure:** The development of healthcare facilities, from design of health facilities to construction and operation.
- **Digital health:** The use of telecare and telehealth, mHealth, and eHealth solutions to prevent and manage chronic illnesses more effectively.
- **Clinical services:** The design and delivery of clinical services across primary and community care, secondary care, and tertiary care and specialist services.
- **Health workforce training:** The delivery of high quality, accredited education and training of the whole health workforce, from doctors and nurses, to pharmacists, allied health professionals, and managers.

UK companies have significant activity in the first three of these sub-sectors, with NHS, state and academic bodies playing a growing role in the delivery of clinical services and health workforce training abroad as discussed in Chapters 2 and 3. With regard to healthcare infrastructure and digital health in particular, UK architects, construction companies and healthcare IT companies have always made an important contribution to strengthening the health system in the UK, and increasingly are performing this role overseas.

This section will look at three major areas of the 'healthcare' sector: Healthcare UK and the companies that it supports to export overseas; UK-based consultancy and professional services firms; and two case studies of major UK healthcare companies – BUPA and the International Hospitals Group.

Companies supported by Healthcare UK to export overseas

Healthcare UK is a joint initiative of DH and UKTI launched in January 2013 to help UK companies raise their international profile to do more business overseas. The bulk of their activity to date has been in supporting the private sector, but they also support the NHS, public bodies and charities to be more active in key markets. Their four objectives are:

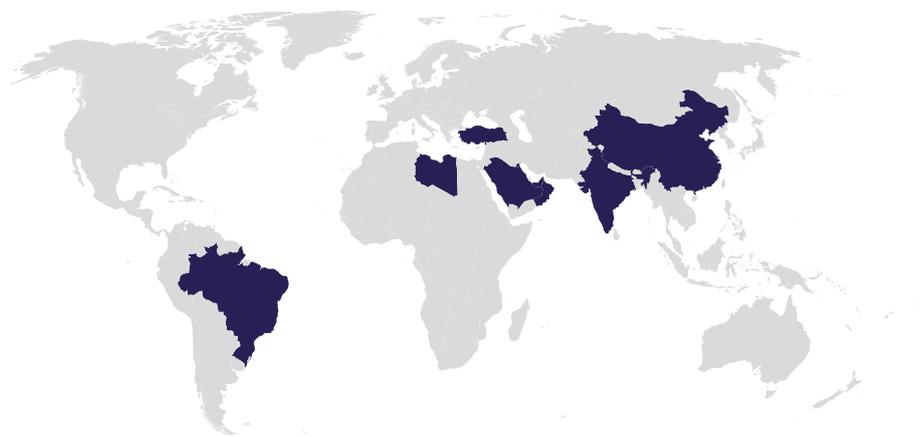
1. Engage and develop the UK healthcare sector to maximise export potential
2. Raise the profile of the UK healthcare sector internationally
3. Identify the biggest opportunities in healthcare
4. Help the UK healthcare sector access leads and convert them into business successes

Their geographic footprint is illustrated in Figure 47, showing a focus in countries that are looking to strengthen their health systems and have sufficient economic growth to fund this expansion. They undertake a range of activities including high-level trade missions abroad, hosting missions in the UK, seminars and events, all to raise the profile of UK healthcare organisations, public and private. Since their launch, the number of these activities has increased year on year, as have the number of UK companies benefiting from their support. Similarly, Healthcare UK has supported NHS and public sector organisations to build partnerships to share their expertise, for example PHE's visit to Hong Kong and China in 2014 to identify new ways of working together and commercial opportunities.

The success of Healthcare UK can be seen in the rise in export opportunities identified for the UK healthcare industries, from £10.8bn in 2013/14, to £11.9bn in 2014/15. Healthcare UK helped the UK healthcare sector generate exports of £749m 2014/15 up from £556m in 2013/14. Outside of Healthcare UK priority countries, a broad network of UKTI offices around the world support healthcare companies to export to other markets.^(269, 270)

Of course these figures only represent a proportion of total commercial healthcare activity overseas. A large number of UK healthcare companies have longstanding relationships and activities in other countries that pre-date the creation of Healthcare UK, or operate in other markets such as Europe or the USA. Two examples of these are BUPA and IHG, discussed in further detail below. Nonetheless, these figures illustrate the scope and growth of activity in this sector.

Figure 47: Map of Healthcare UK priority countries



Source: Healthcare UK, 2015

Respondents in the healthcare sector noted that a key strength for UK companies was the association with the NHS, with both the reputation of the NHS and the experience gained through providing services to the NHS playing a critical role in winning contracts overseas. Accordingly, it was noted that the risk to the reputation of the NHS domestically represented a major threat to the ability of these companies to export their services internationally. In addition, commercial competition from other high-income countries is increasing, including the USA, Canada and Australia. These countries were noted to be investing much more than the UK in developing strong commercial links in emerging economies.

“ When (we) visit these countries and meet people, when they think about the UK, they think about the NHS, and for them it's synonymous with quality healthcare for everybody at low cost, and so they want to work with UK organisations to improve health in their own countries ”

Some interviewees highlighted a broader threat to the UK's international reputation from the government being seen to be 'pushing sales' in health rather than being seen as a voice for supporting UHC and stronger health systems across the world. These conflicting messages were noted to have a knock-on effect on the UK's reputation and foreign governments' trust in other UK organisations such as DFID and NICE International. This was noted to ultimately limit the UK's ability to influence health regulation, good governance and the UHC agenda.

Case studies of UK healthcare companies improving health systems abroad⁽²⁷¹⁾

Health systems development:

- **Health system reform in Dubai:**

UK professional services firm PA Consulting was contracted by the Executive Council of Dubai to create the blueprint for the health and social development sector of the country's reform programme in the Dubai Strategic Plan 2015. Having gained buy-in from the Dubai Health Authority (DHA), Department of Health and Medical Services (DOHMS), and other stakeholders, they have now gone on to draw up detailed strategies and implementation plans for health system reform in Dubai.

- **Improvement of primary care in India:**

UK professional services firm EY was contracted by the state government of Tamil Nadu to support a large primary care improvement programme. EY's input included mapping out the actions needed to develop the new system, helping the state government to build relationships with UK suppliers, and facilitating workshops for senior health officials to plan the pilot phase for the improved system.

Digital health

- **Electronic patient records in China:**

UK healthcare IT company TPP have taken the expertise developed in the UK where they provide electronic health records for over 36 million patients, accessed by over 200,000 NHS staff, and extended this to patients in China. They are working on projects with the Zhejiang Provincial Centre for Disease Prevention and Control to enhance the public health surveillance system for Zhejiang's 54m citizens, and working on pilots with Ninghai and Nanjing Health Bureaux to introduce electronic patient records into community clinics.

Infrastructure

- **Designing an environmentally sustainable hospital in the USA:**

London based Steffian Bradley Architects has worked with more than 200 healthcare organisations around the world on over 1,000 healthcare projects. One of these was the new Baystate Medical Center in Springfield, Massachusetts. This award-winning \$259m project used the Green Guide for Healthcare to ensure sustainability, from site plan and layout to material selection and construction. The design also focused on the quality of the patient, visitor and staff experience, with exposure to the outdoors and abundant natural light from a five-storey central light well in each medical wing. It won the grand prize in Building Magazine's America's Best Building of the Year.

UK based consultancy and professional services

In addition to those actors mentioned, there are a broad range of management consultancy and professional services firms in the UK that are active in the healthcare (and life sciences) sectors across the world. The 'big three' management consultancy firms are the US firms McKinsey, Bain, and Boston Consulting Group (BCG), with

Accenture also a major actor in this area. All four have highly active healthcare consultancy departments, and large offices in London from where they support governments and health providers across the world to improve the quality of their healthcare delivery.

Likewise, the 'big four' audit and professional services firms are the UK based PricewaterhouseCoopers (PwC) and Ernst & Young (EY), and Deloitte and KPMG, headquartered in the USA and the Netherlands respectively, but with large UK offices. An increasing amount of their revenue is coming from consultancy, with healthcare consultancy an important part of that portfolio. The UK KPMG office carried out 32 projects on improving overseas health systems in 2014, including supporting the Singapore Ministry of Health to design a more integrated health system to meet the nation's changing healthcare needs.⁽²⁷²⁾

The UK is also home to Mott MacDonald, a specialist provider of management and development consultancy services, employing 16,000 staff in 140 countries. They use their broad experience to work together with donors, governments and health care providers to improve health across the world. Some examples of these include: supporting the government of Pakistan to promote safe motherhood practices through a mini drama series in Urdu; providing psychosocial support for caregivers in South Africa to protect vulnerable children; and supporting and evaluating innovative programmes to reach the missing 3m people living with TB across 24 countries worldwide.⁽²⁷³⁾

Major UK healthcare companies: case studies

BUPA

Bupa Global is the world's largest expatriate health insurer and a leading provider of health and care around the globe. It provides a range of medical services including: health insurance, care homes, retirement villages, hospitals, primary care centres, dental clinics, workplace health services, home healthcare, and others. It employs 79,000 employees across the world, serving 29 million customers in 190 countries worldwide, generating £9.8bn in revenues and £637.8m in profit in 2014.⁽²⁷⁴⁾

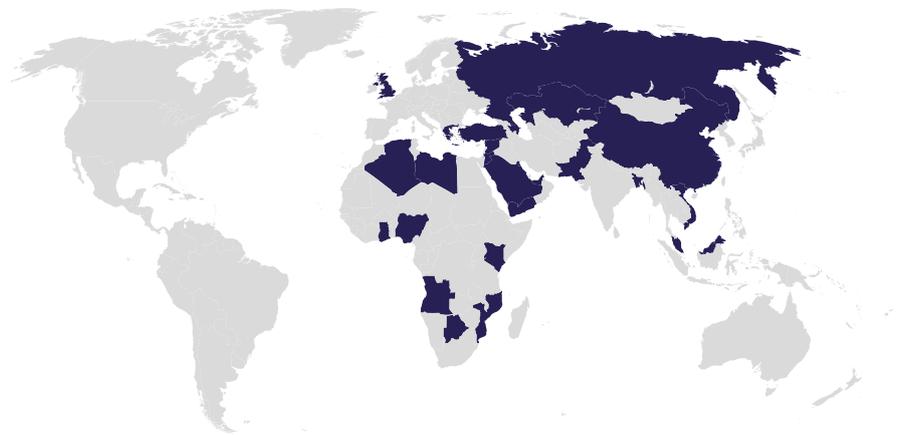
Bupa undertakes initiatives to ensure the provision of quality healthcare in all of the markets that it operates in, with over 11,500 independent participating hospitals and clinics worldwide. One of the major programmes it engages in is the 'Hospital Quality Programme', which applies the experience of over 60 years of providing health in the UK to raise the standard of care in health facilities across the world. The programme evaluates medical facilities on a number of criteria including: how hospitals monitor and improve the quality of care provided; their use of evidence-based, cost-effective medical practice; and their use of recognised safety protocols, for example the World Health Organisation Safe Surgery checklist. They have visited hospitals Mexico, Brazil, Nigeria, Ghana, Kuwait, Qatar, Russia, Denmark and Indonesia with further sites planned in 2015.⁽²⁷⁵⁾

BUPA is also a key partner in an initiative to use m-health to combat NCDs such as heart disease, diabetes and cancer in LMICs, working in together with the WHO, GSK and the International Telecommunication Union (ITU) through the Be He@lthy, Be Mobile programme. LMICs are now facing a double burden of communicable and non-communicable disease, and m-health has the potential to reinforce their existing national health activities to prevent, monitor and manage NCDs. The objective of this programme is to achieve healthier populations at lower cost, and dissemination of good practice around the world.⁽²⁷⁶⁾

International Hospitals Group (IHG)

IHG is one of the largest healthcare services companies in the world, headquartered in Buckinghamshire. It was established in 1978 and has since completed over 450 healthcare projects in 49 countries. Clients have included 22 national governments, the UN, World Bank and the private sector. The range of expertise includes the full spectrum of healthcare services, from feasibility studies and planning and design, to project finance and construction, to equipping hospitals and recruiting and training staff and finally to hospital accreditation and quality assurance. It works closely with the UK government, for example facilitating finance through UK Export Finance, the UK's official export credit agency, and with the NHS. Figure 48 shows the countries that IHG has worked in, though due to client confidentiality, not all are shown.⁽²⁷⁷⁾

Figure 48: Map of IHG's global footprint



Source: IHG, 2015

The life sciences sector

Overview

The life sciences sector plays a critical role in improving health globally, from the research and development of life-saving medicines, to the design and manufacture of medical devices such as radiology equipment and surgical instruments. The UK has a long history as a global leader in this field, from the discovery of penicillin by Sir Alexander Fleming in 1928, to the development of MRI and the first MRI scan of living tissue carried out by Sir Peter Mansfield in 1976. Both won the Nobel prize in Physiology or Medicine for their work, joining the 77 Nobel Prizes the UK holds for contributions to biomedical science.⁽²⁷⁸⁾

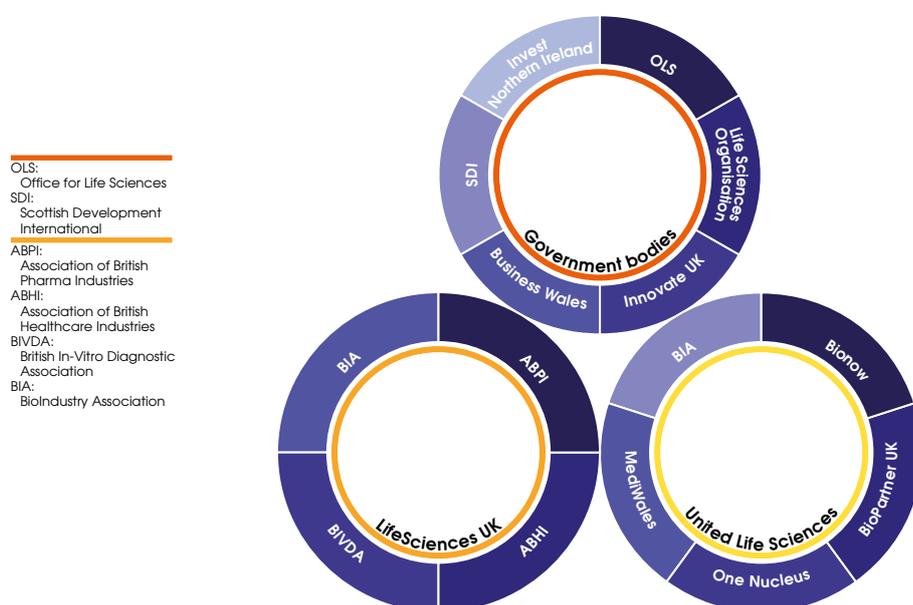
Today there are many countries that are active in life sciences, but the UK remains a significant global player with the health life sciences sector comprising over 4,800 companies employing an estimated 183,000 people, and generating a turnover of over £55bn. It has benefitted from a strong history and the long-term vision of the last two governments, but requires sustained attention to remain globally competitive in the coming years.⁽²⁷⁹⁾

The life sciences sector contains 3 sub-sectors: Medical Technology (MedTech), Medical Biotechnology (BioTech) and Pharmaceuticals (Pharma). The MedTech sector engages in R&D and manufacturing of medical devices; the BioTech sector engages in the R&D and manufacture of drug treatments and advanced therapies

using biological techniques; and the Pharma sector comprises large companies with a global turnover of >£640m, whose major activity is the R&D and manufacture of drugs using any techniques. Companies that form part of the supply chains for these sectors are also included, as they perform a key role in the development and delivery of these goods. These definitions follow those used by the government in the annual 'Strength and Opportunity' reports.

There are a range of government bodies and industry associations that support the life sciences sector in the UK to develop and export across the world. These include government bodies that provide funding and support the sector to grow and trade overseas and strategic partnerships of industry bodies as shown in Figure 49.

Figure 49: Government bodies and strategic partnerships supporting the UK life sciences sector



MedTech

What is MedTech and its contribution to health?

The MedTech sector develops medical devices, diagnostic tests, imaging equipment, and e-health solutions used to diagnose, monitor and treat patients suffering from a wide range of conditions. These devices include MRI and ultrasound scanners, laboratory tests and blood glucose monitors, cardiac and orthopaedic implants, hospital beds, and many more.

These innovations help people live longer, healthier, more productive lives through more precise diagnosis and improved management of disease. They can enable a shift to community and self-care through better community and home monitoring of diseases, keeping patients out of hospital and independent for longer. In the future, the increased diagnostic precision will be critical in the transition to personalised medicine, which will see improved outcomes and fewer complications for patients.

MedTech advances therefore have the potential to increase productivity and efficiency of healthcare systems. However, without appropriate consideration of cost-effectiveness they also have the potential to drive up the cost of healthcare through providing limited additional benefit at significantly increased cost. At a time

of cost pressures in health systems across the world, growth in the MedTech sector must therefore be balanced with appropriate regulation to ensure that only those innovations that deliver improvements in the quality of care cost-effectively are rolled out in the UK and across the world.

What does the UK MedTech sector look like? ⁽²⁷⁹⁾

- There are over 3,200 MedTech companies spread across the UK, generating a turnover of £18.1bn and employing 88,000 people. Employment and turnover has increased every year since 2010.
- 97% these companies are SMEs employing less than 250 people, with 83% of these having a turnover of <£5m.
- Revenue growth across the whole sector between 2009 and 2014 was approximately 5.8% per year, with employment growing at 9.1% per year.
- The top 5 core product segments in terms of turnover in 2014 were:
 1. Single use technology (e.g. syringes and gloves)
 2. In-vitro diagnostics (e.g. blood tests and other microbiology tests)
 3. Wound care and management (e.g. dressings)
 4. Orthopaedic devices (e.g. hip and knee replacements)
 5. Ophthalmic devices (e.g. cataract surgery devices)
- The fastest growing core product segments between 2009-2014, each growing at over 5% per year were:
 1. Wound care and management
 2. Ophthalmic devices
 3. Single use technology
 4. In-vitro diagnostics
 5. Orthopaedic devices

The industry body for MedTech, the Association of British Healthcare Industries (ABHI), supports the sector in the UK, promoting rapid adoption of products within the NHS and in key global markets.

What does the global market for MedTech look like?

Global MedTech sales were \$380bn in 2014, projected to grow by 5% each year to reach \$514bn in 2020. This is slower than the 5.3% growth projected in the prescription drug market, largely due to the recent resurgence in confidence in the Pharma and BioTech industries globally. The MedTech sector is also a large investor in R&D with a total spend of \$22.9bn in 2013, projected to grow by 4.2% annually to reach \$30.5bn in 2020.⁽²⁸⁰⁾

The largest segment globally is in-vitro diagnostics, with sales of \$47.4bn, and this is projected to grow by 6.1% per year to reach \$71.6bn in 2020. Whilst the current established markets are the USA and Europe, huge growth in demand is predicted from Asia and specifically China. The top segments in the global market and their rate of growth is shown in Figure 50.

Figure 50: Top sectors in the global market for MedTech

		Worldwide sales (\$bn)		Annual growth
Device area		2013	2020	%
1	In vitro diagnostics (IVD)	47.4	71.6	+6.1
2	Cardiology	39.9	57.3	+5.3
3	Diagnostic imaging	35.5	47.0	+4.1
4	Orthopaedics	33.8	45.9	+4.5
5	Ophthalmics	24.5	37.7	+6.3
6	General & plastic surgery	19.1	26.7	+4.9
7	Drug delivery	17.8	23.5	+4.1
8	Endoscopy	15.9	23.2	+5.5
9	Dental	12.5	18.0	+5.3
10	Diabetic care	11.9	16.4	+4.7
11	Wound management	12.0	16.0	+4.2
12	Nephrology	11.1	14.9	+4.3
13	General hospital & healthcare	8.3	10.8	+4.0
14	Ear, nose & throat (ENT)	7.2	10.8	+6.1
15	Neurology	6.1	9.8	+7.1
Top 15		303.0	429.7	+5.1
Total worldwide sales		363.8	513.5	+5.0

Source: EvaluateMedTech World Preview 2014, Outlook to 2020

What is the UK's position in that market?

The UK has 1 company in the global top 20: Smith and Nephew, with sales of \$4.4bn in 2013 projected to grow by 5.7% per year to reach \$6.4bn in 2020. The USA dominates this sector with both the largest MedTech company, Johnson and Johnson, and 12 out of the 20 largest companies, together holding one third of the global market share.⁽²⁸⁰⁾

Inclusive of imports and re-exports by countries such as the Netherlands that act as a distribution hub for European markets, the UK is the 9th largest exporter in the world. This puts the UK behind the USA, Germany, Netherlands, China, Belgium, Switzerland, France and Japan. The total value of exports rose 7.4% in 2013, and as of November 2014 stood at \$6.35bn.⁽²⁸¹⁾ The main markets for export are Europe, followed by the USA, with exports to China growing rapidly.⁽²⁸²⁾ However the global footprint is much larger than this, for example Penlon Ltd design and manufacture over 90 products at their facility in Oxford and export to over 90 countries worldwide.⁽²⁸³⁾

BioTech

What is BioTech and its contribution to health?

The major distinction between drugs developed through biotechnology and those developed through 'traditional' approaches is the method of manufacture: biopharmaceuticals are manufactured using living organisms such as bacteria, yeast and mammalian cells, and traditional pharmaceuticals are manufactured through chemical processes. Whilst an increasing proportion of R&D and sales for large Pharma firms are from biopharmaceuticals, BioTech firms are generally much smaller and more research focused. As commercialisation and revenue generation takes place at the later stages of development, the role of start-up capital is crucial to the success of BioTech firms, whether this be from governments, venture capital firms, licensing arrangements with big Pharma, or other sources.

The BioTech sector plays a key role in developing precisely targeted treatments and diagnostic approaches to diseases, often those where traditional pharmaceuticals have made limited progress. Examples include drugs for cancer such as breast cancer and melanoma, autoimmune diseases such as rheumatoid arthritis and psoriasis, and rare diseases. Going forwards, BioTech is also providing new avenues for the development of antibiotics in the context of growing antimicrobial resistance, and driving the emerging fields of precision medicine and regenerative medicine. These innovations have the potential to radically transform health across the world, improving outcomes for a broad range of conditions from cancers to neurodegenerative diseases.

BioTech is also providing novel solutions to global health issues such as dengue fever, the world's fastest growing mosquito-borne disease that kills 25,000 people and costs the global economy \$5bn every year. The UK-based Oxitec is using advanced genetics and molecular biology to dramatically reduce or eliminate mosquito populations in affected areas, introducing genetically modified sterile males to reduce mosquito populations.⁽²⁸⁴⁾

What does the UK BioTech sector look like?⁽²⁷⁹⁾

- In 2014 there were over 1,000 BioTech companies in the UK, generating a turnover of £4.8bn and employing 23,000 people. Revenue has grown annually with the exception of a dip in 2012/13, and employment has grown annually since 2012.
- The sector is very young compared with the Pharma sector, with 98% of companies having fewer than 250 employees, 55% having 4 or fewer employees, and 85% with a turnover <£5m.
- Revenue growth between 2009-2014 was 4%, driven by growth of over 14% per year in the therapeutic proteins and small molecules segments. Because of the nature of the BioTech sector and the size of the companies involved, single product approvals can have a significant impact on revenue growth.

- The top 5 product segments by revenue in 2014 were:
 1. Small molecules
 2. Antibodies
 3. Therapeutic proteins
 4. Blood and tissue products
 5. Advanced therapy medicinal products (e.g. gene therapy, cell therapy and tissue engineering)
- Two-thirds of the companies included in this sector are 'supply chain' companies. This segment provide services to both BioTech and Pharma firms, from clinical trials management to manufacturing and facilities services. There are over 930 supply chain companies employing 33,700 people with a turnover of £9.1bn. These include a number of global companies that export their expertise in Pharma and Biotech specialist services across the world.

The industry association for BioTech in the UK, the BioIndustry Association (BIA), works together with BioTech companies to develop the sector and to support the export of biotech products from the UK across the world.

What does the global market for BioTech look like?

Within the global market for pharmaceuticals, the proportion of sales from biological drugs versus traditional drugs has gone from 14% in 2006 to 22% in 2013, and is projected to rise to 27% in 2020. This equates to a more than doubling in revenues from \$79bn to \$165bn between 2006 and 2013, projected to reach \$291bn in 2020. Seven out of the top 10 selling drugs in the world are biologics, with the proportion of biological drugs in the top 100 pharmaceutical products more than doubling from 21% in 2006 to 45% in 2013, projected to reach 52% in 2020.⁽²⁸⁰⁾

Globally, the growth in sales of biological drugs has exceeded that in the pharmaceutical market by 2-7% between 2008-2013. Additionally, as biological drugs are much more difficult to replicate than traditional pharmaceuticals, growth in this market is helping to moderate the impact of patent expiries on growth in the broader pharmaceutical sector. Whilst this is good news for BioTech and Pharma companies, it does mean that the benefits of these drugs are less likely to be made available to poorer countries and patients. However, the capacity and market for generic versions of biological agents ('biosimilars') is growing, discussed below.

What is the UK's position in that market?

The UK has the 4th largest biotech pipeline in the world and the largest in Europe, with 460 biotech drugs under development in 2013, up 15% from 2012. The UK BioTech sector also leads Europe in the total amount of capital raised and financing rounds for biotech. Given the reliance of the BioTech industry on attracting capital investment to develop products, this is a crucially important indicator.⁽²⁸⁵⁾

“ The UK has raised far more capital for biotech companies than other parts of Europe, and in terms of candidates in the pipeline being developed by UK companies, again, we far outstrip anywhere else in Europe. So we're the clear European leader. ”

Pharma

What is Pharma and its contribution to health?

Pharmaceuticals have made a major contribution to improving the health of populations across the world, leading to increased life expectancy, and improved wellbeing throughout life. Notable examples include vaccines, which have dramatically reduced the incidence of major diseases including measles, diphtheria, and nearly eradicated polio; antibiotics and the ability to treat previously life-threatening bacterial infections; the dramatic improvement in mortality following heart attacks through the use of aspirin and fibrinolytics; chemotherapy and the ability to improve life expectancy in people who develop cancer; and antiretrovirals and the transformation of HIV from a certain death sentence into a chronic disease.

These drugs have the potential to benefit patients from high income to low income countries, infectious diseases to NCDs, maternal and child health to elderly care, physical health to mental health. The result is healthier, more productive people across the world.

However, drugs and vaccines also have the potential to do harm through unintended effects, and have to go through rigorous testing for safety and efficacy before being made available to patients. The historic lack of transparency in this sector has limited the ability of regulators and clinicians to make informed decisions on safety and efficacy. Even once they are approved, poor regulation of their use can also lead to difficulties, for example the rise of antimicrobial resistance due to inappropriate prescribing of antibiotics around the world. Finally, only a small fraction of products researched make it to market and companies have to recoup their investment through patents. The high price of patented drugs can restrict the benefits of these drugs to wealthy countries and patients. Accordingly, growth in the pharmaceutical sector must be balanced with appropriate regulation to ensure the safety and efficacy of drugs reaching the market, and initiatives to improve access to medicines around the world.

What does the UK Pharma sector look like?⁽²⁶⁵⁾

- In 2013 there were 545 Pharma companies in the UK, generating a turnover of £32.4bn and employing 70,000 people.
- Compared with the MedTech and BioTech sectors there are comparatively more companies with a turnover greater than £5m and 47 companies with a turnover greater than £100m.
- The UK sector includes the Global Top 20 firms, all of whom have activity in the UK and include the UK companies GlaxoSmithKline (GSK) and AstraZeneca. The sector is highly skewed, with the Global Top 20 firms accounting for 61% of the total turnover of the sector and the majority of the employment. These firms have activities in multiple segments, including biological agents, so it is less easy to disaggregate the turnover by segment.

- Revenue growth across the whole sector between 2011-13 dropped by 9%, driven by a drop in turnover in the global Top 20. This is related to significant restructuring in the global pharmaceutical industry over that period, with employment falling by as much as 300,000 globally between 2000-2010. Many of these staff, however, were noted to have found employment in the growing UK BioTech sector during this period. In 2014, the sector started to show signs of a recovery in line with the global outlook, and revenue growth has turned positive again.
- Likewise, there has been a fall in pharmaceutical manufacturing in recent years. Between 1991 and 2009 the pharmaceutical manufacturing sector grew on average by 4.4% annually and was the best performing of all manufacturing sub-sectors. During the global recession this fell markedly by 25.9% between 2009-2013, with performance at the lower end of the whole manufacturing sector. Productivity was at its peak in 2009 at seven times higher than the average for the whole economy, and has been on a downward trend since.⁽²⁸⁶⁾ Analysts are optimistic that these indicators are turning around due to the improved climate for investment in the UK.⁽²⁸⁷⁾
- Growth in the Pharma sector is strongly dependent on investment in R&D of new products to develop a strong pipeline, as the profitability of any drug falls after the expiry of its patent. The UK Pharma sector invests up to £11.5m every day in R&D, more than any other industrial sector, and 25% of the total R&D expenditure by UK business. It is consequently one of the leading high-technology sectors in the country. AstraZeneca and GSK have both benefited from a restructuring of their R&D with the development of strong late-stage pipelines. However, overall R&D expenditure declined from 2011-2013 from a peak of close to £5bn to £4.1bn.⁽²²⁴⁾

The industry association for Pharma in the UK, the Association of British Pharmaceutical Industries (ABPI), works together with Pharma companies to develop the sector and to support the export of medicines from the UK across the world.

What does the global market for Pharma look like?

Global Pharma sales were approximately \$749bn in 2014, projected to grow by 5.1% per year to reach \$1tn in 2020. This comes on the back of a contraction of 1.6% in 2012 and relatively flat growth of 0.3% in 2013. The higher projections are related to strong drug pipelines, with 2013 the best year ever for new drug approvals, and an increasing proportion of sales coming from biological products that are more difficult to copy.⁽²⁸⁸⁾ However, the Economist Intelligence Unit warns that patent expiries will continue during the coming years, and the market for biosimilars may finally take off as technical and legal hurdles are overcome.⁽²⁶⁸⁾ Indeed, many biosimilars have already been approved in Europe, and the first biosimilar was licenced in the USA by the FDA in March 2015.⁽²⁸⁹⁾ The 5 biggest segments by sales in 2013 were: oncology, anti-diabetics, anti-rheumatics, anti-virals, and vaccines, with oncology showing the fastest growth of 11.2% per annum. The top 15 areas and their projected growth are illustrated in Figure 51.

Figure 51: Top segments in the pharmaceutical sector by sales and projected growth to 2020

	Therapy area	Worldwide sales (\$bn)		Annual growth
		2013	2020	%
1	Oncology	72.8	153.1	+11.2
2	Anti-diabetics	38.4	68.9	+8.7
3	Anti-rheumatics	44.9	57.1	+3.5
4	Anti-virals	27.8	45.6	+7.3
5	Vaccines	25.6	41.3	+7.1
6	Bronchodilators	32.6	35.9	+1.4
7	Sensory organs	17.5	28.2	+7.1
8	Anti-hypertensives	33.7	26.1	-3.6
9	MS therapies	16.2	21.8	+4.3
10	Dermatologicals	13.5	19.2	+5.1
11	Anti-coagulants	8.9	17.8	+10.4
12	Anti-bacterials	14.6	17.7	+2.8
13	Anti-fibrinolytics	11.1	16.4	+5.7
14	Immunosuppressants	7.9	14.8	+9.4
15	Anti-hyperlipidaemics	19.3	13.0	-5.5
Top 15		385	577	+6.0
Total worldwide sales		754	1,065	+5.0

Source: EvaluatePharma World Preview 2014 – Outlook to 2020

The biggest markets for selling into are the USA, Japan, China, Germany and France, with the Brazilian market growing rapidly year on year. The global Pharma sector is a major spender on R&D, investing \$136.7bn in 2013, expected to grow by over 2% per year.⁽²⁸⁰⁾

This has been in decline in recent years as reflected in the UK market statistics, but recent trends suggest that this has recovered, with restructuring to focus on the most promising areas, increased government investment, increasing phase III trial approvals, and the value of the R&D pipeline surging.⁽²⁹⁰⁾

What is the UK's position in that market?

The Top 10 companies by sales include two UK companies: GSK at 5 with annual sales of \$33.1bn in 2013, projected to rise to \$41.2bn in 2020, and AstraZeneca at 8 with annual sales of \$24.5bn in 2014, projected to rise to \$26bn in 2020.⁽²⁸⁸⁾ The UK's position in the top 10 is illustrated in Figure 52.

Figure 52: Top 10 pharmaceutical companies in the world by sales in 2013 and projected growth to 2020

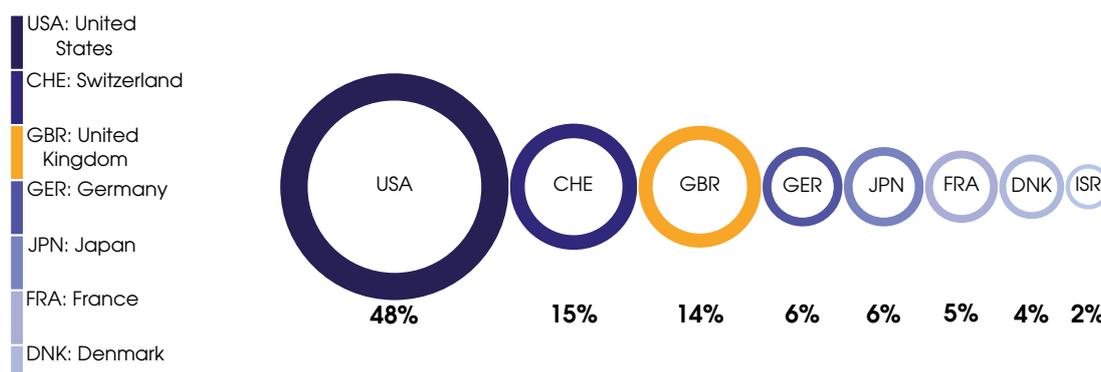
		Worldwide sales (\$bn)	
	Company	2013	2020
1	Novartis	46.0	54.4
2	Roche	39.1	52.4
3	Sanofi	37.7	50.0
4	Pfizer	45.0	47.8
5	GlaxoSmithKline	33.1	41.2
6	Merck & Co	37.5	39.4
7	Johnson & Johnson	26.5	35.9
8	AstraZeneca	24.5	26.0
9	Novo Nordisk	14.9	25.8
10	Gilead Sciences	10.8	23.7

Source: EvaluatePharma World Preview 2014 – Outlook to 2020

The UK is a strong exporter of pharmaceuticals with over \$30bn of exports in 2013, ranking 6th behind Germany, Switzerland, Belgium, the USA and France.⁽²²⁴⁾ Between 1999-2014 this has consistently generated a large trade surplus for the UK, but this has fallen from its peak in 2010 to £1.1bn in February 2015.⁽²⁹¹⁾ In addition to the key global pharmaceutical markets outlined above, UK Pharma has a truly global footprint, reaching over 170 countries worldwide.

An analysis of the world's top 100 medicines by nationality of company showed that the UK has the third largest share of sales with 14%, behind the USA on 48% and Switzerland on 15%. Figure 53 shows the breakdown by country.⁽²⁹²⁾

Figure 53: Share of sales of top 100 prescription medicines by country



Source: ABPI, 2015

The UK also plays a central role in pharmaceutical research, with approximately one-eighth of the world's most popular prescription medicines developed in UK laboratories.⁽²⁹³⁾ One example of this is the world's top selling drug Adalimumab (Humira) which is manufactured by the US company AbbVie. It was the world's first drug of its type, targeted to manage the symptoms of rheumatoid arthritis, and was developed through research on antibody technology pioneered by Cambridge

Antibody Technology (CAT), a UK BioTech company. Cambridge Antibody Technology was acquired by AstraZeneca for £702m in 2006 and Adalimumab is now manufactured by AbbVie and Zydus Cadila (as the generic biosimilar Exemptia).

Case study: GSK and Access to Medicines

GSK is one of the world's leading pharmaceutical firms, with a significant global commercial presence in more than 150 markets, manufacturing operations in 36 countries and employing over 97,000 people. In the pharmaceutical portfolio, they hold leading positions in respiratory disease and HIV, and the vaccines business is one of the largest in the world, delivering 800 million doses to 170 countries in 2014.

In addition to activity in high-value markets, GSK has been innovative in evolving its business model and corporate objectives to extend access to medicines all. A consequence of this is that it has ranked 1st out of the top 20 pharmaceutical companies across the world in the independent Access to Medicines Index (AMI) consistently since it was launched in 2008, up to and including the most recent ranking in 2014.⁽²⁹⁴⁾ The AMI is jointly funded by the Gates Foundation and the UK and Dutch governments, and measures what the pharmaceutical industry is doing to improve the situation of 2 billion people in the world having no access to medicines. GSK's achievements in this regard include:

- Implementing an Africa-focused business model with differentiated strategies for high-potential markets (investing for growth) and less-developed markets (supporting development) to improve access to medicines across the whole of the wealth pyramid.
- The use of equitable pricing strategies for a wide range of products in the majority of countries where it is present, including the use of tiered pricing for over 20 years, as well as capping the prices of patented medications and vaccines at 25% of UK/France price in Least Developed Countries (LDCs). They also take a proactive approach to IP management, using a novel licensing arrangement with tiered royalties based on country income level.
- Advancing adverse-event reporting in Africa through a crowd-sourcing platform using low-tech solutions such as SMS and phone calls.
- Establishing an innovative 'Open Lab' for Africa to improve the understanding of NCD variations in the African setting to inform prevention and treatment strategies of NCDs in African patients to address specific needs in these populations.
- Innovative partnerships to increase impact, e.g. with Save the Children to combine expertise and resources to develop products for neonatal health conditions such as neonatal sepsis; with Vodafone to use mobile technology to remind mothers to access vaccination services and clinics to report vaccine stock levels to align supply and demand; and with Pfizer to focus on the R&D and access to HIV/AIDS medicines through the joint venture ViiV Healthcare.

GSK has also made a huge contribution to tackling Neglected Tropical Diseases (NTDs) and scientists at GSK have spent over 30 years developing the world's first vaccine for malaria. These contributions are discussed in the case studies on NTDs and malaria in Chapter 1.

Venture capital and financing for life sciences

Private equity (PE) and Venture Capital (VC) firms provide finance to companies in return for a stake in those companies, raising funds from pension funds, insurance companies, endowments, wealthy individuals and borrowing. The ultimate goal of these firms is to create value and then sell their stake, returning the profits to investors and investing in the next opportunity.

Whereas PE funds invest in more mature companies to drive business growth through improved productivity and efficiency savings, VC funds invest at the early stages in a company's development, driving innovation and growth. This effect on innovation can be seen through higher productivity, better resource allocation, and a greater number of patents granted to VC funded firms.⁽²⁹⁵⁵⁾ For the MedTech and BioTech sectors, both of which contain a large number of university spin-outs and relatively young SMEs looking to raise early capital to develop their products, the availability of VC financing is critical to their success.

Following the risk-averse environment in the aftermath of the global financial crisis, VC investment for UK life sciences has improved significantly, rising 41% in 2014 to reach £527m.⁽²⁹⁶⁾ Two of the three largest funding rounds in 2014 were for immunotherapy to fight cancer and infectious diseases, raising \$104m for Oxford-based Adaptimmune and \$78.57m for London-based Cell Medica.

The emergence of new funds with transatlantic investment also signifies a new phase for investment in the UK life sciences sector. Epidarex Capital unveiled a new £47.5m VC fund for early-stage life science companies including university spin-outs, focusing on commercialising the most innovative technologies at the earliest stage. The range of investors included four top research universities, King's College London and the Universities of Edinburgh, Glasgow and Strathclyde, the American Pharma company Eli Lilly, and the European Investment Fund.

The UK VC sector also benefits from the number of different types of VC funds that have come here, ranging from 'classic' VC funds such as SV Life Sciences; to corporate VC funds such as the VC arm of GSK; to new funds such as Imperial Innovations, developed out of the technology transfer office Imperial College London, and Syncona Partners LLP, an independent subsidiary of the Wellcome Trust.

Looking more broadly at investment in UK life sciences, UK companies raised a 7 year high of £734m of capital in the first half of 2014, considerably higher than the £438m raised in the whole of 2013. Furthermore, £1.25bn was raised from the public markets in life sciences Initial Public Offerings (IPOs) and follow-on offerings on the London Stock Exchange. This placed the UK as the top European destination for life science investment, though it still lags behind the USA.⁽²⁸⁵⁾ The UK government also provides funding for life sciences, and this is discussed in the next section

“ There are a lot of new kinds of funds that have come to the UK, so I think we're in a reasonably good position. But we're still a quarter of the money that's available in the US. ”

Despite this recent rise in VC funding and IPOs, some respondents noted that there remains an absence of long-term capital investment available for UK life sciences companies, limiting the ability of these companies to grow to a global scale rather than being bought out by larger US companies. There are several examples of UK research and product development being commercialised in the US, limiting the return to the UK economy. This was noted to be a major weakness of the UK sector.

“ The UK has successfully transitioned and translated many of its scientific discoveries into practical, tangible clinical products. However, probably what we've not done the way that the States have done it is build those products within companies that have grown to global scale. ”

State sector support for the life sciences sector

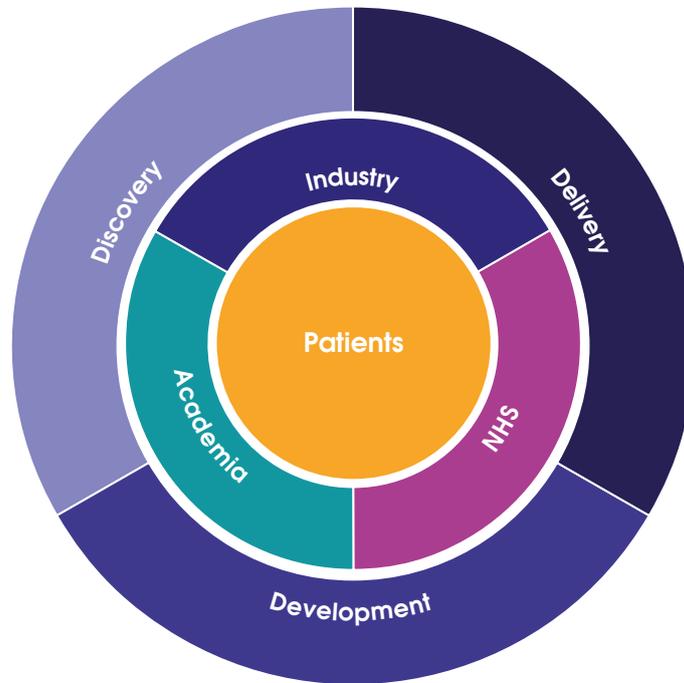
UK Government Strategy for UK Life Sciences

There has been sustained commitment from government to strengthen the position of the UK as a global centre of excellence for life sciences. The Office for Life Sciences was established in January 2009, and in 2010 released the report 'Life Sciences – The UK: Collaboration for Success.'⁽²⁹⁷⁾ This highlighted five strengths of the UK in this sector, together with a 'package of actions to transform the operating environment for UK Life Sciences'. The strengths included:

1. World-class science, innovation and skills
2. A culture of collaboration between industry, academia, the NHS and the government
3. The NHS as one of the largest purchasers and a proven research partner for developing and evaluating new medicines and technologies
4. A strong environment for clinical trials
5. A supportive business and regulatory environment

Building on this, in 2011 the following government launched a ten-year Strategy for UK Life Sciences, aimed at establishing the UK as a global leader.⁽²⁹⁸⁾ Since it was launched 3 years ago the industry has agreed over £3.5bn of investment in the UK, expected to create over 11,000 new jobs. It was designed around three key principles shown in Figure 54.⁽²⁹⁹⁾

Figure 54: Key principles and the relationship between industry, academia and the NHS envisioned by the Strategy for UK Life Sciences



Building a life sciences ecosystem

To build on the existing strengths and partnerships between universities, the wider research base, businesses and the NHS to establish a cohesive system of integration.

Attracting, developing and rewarding the best talent

Nurturing highly skilled researchers, clinicians and technicians, assisting them to work collaboratively across traditional boundaries to create value throughout the ecosystem.

Overcoming barriers and creating incentives for the promotion of health care innovation

Creating the right environment to translate discovery into real benefits for patients, and nurturing innovation through the translational funding gap, whilst reducing regulatory bureaucracy to provide a route for early adoption and diffusion in the NHS.

Source: Strategy for UK Life Sciences, 2011

As part of this strategy, the 'Life Sciences Organisation' (LSO) was established to facilitate overseas investment into the UK life sciences sector, and exports to overseas markets. In 2013, the government also included 'life sciences, genomics and synthetic biology' and 'regenerative medicine' as two of the 'eight great technologies' where the UK has world-leading research and the potential to be at the forefront of commercialisation.⁽³⁰⁰⁾ This has led to further investment in supporting the transition of key technologies from the laboratory to the marketplace. The case study in Chapter 1 discusses the UK's role in driving progress in genomics and precision medicine, and regenerative medicine is discussed in the box below.

Regenerative Medicine

Regenerative medicine is an emerging field that refers to methods that replace or regenerate human cells, tissues or organs in order to restore or establish normal function.⁽³⁰¹⁾ It brings together a range of disciplines from tissue engineering, nanoscience and biomaterials such as scaffolds, to developmental, stem cell and chemical biology. Regenerative medicine includes the use of bone marrow transplants for diseases such as leukaemia, but has the potential to restore normal function in intractable chronic conditions including neurodegenerative diseases such as Parkinson's disease and stroke, but also heart disease and diabetes.⁽³⁰²⁾ The market is projected to grow from \$1bn in 2012 to over \$35bn by 2019.⁽³⁰³⁾ The UK is a global leader in regenerative medicine, with a range of institutions that form a supportive ecosystem, including: funding and infrastructure for undertaking research and clinical trials; an effective supply chain; established manufacturing capabilities; commercial sector support and engagement; and access to the NHS.⁽³⁰³⁾ One example of this is the UK Regenerative Medicine Platform that brings together the BBSRC, EPSRC and MRC in a £25m initiative to engage in cross-disciplinary research to address the key translational challenges of regenerative medicine.⁽³⁰⁴⁾ Another example is the Cell Therapy Catapult that supports the commercialisation of research.

The Regenerative Medicine Expert Group (RMEG) is an expert group formed for the development and delivery of Regenerative Medicines to the NHS. In December 2014 they published their report 'Building on our own potential: a UK pathway for regenerative medicine'. This outlined the importance of regenerative medicine in delivering a step change in the way we treat disease as well as making a significant economic contribution. It also made recommendations on how to collaborate and remain competitive in the international market to maintain the UK's position as a world leader.⁽³⁰¹⁾

A broad number of initiatives have been launched to deliver the 'Strategy for UK Life Sciences', in addition to changes to the tax and regulatory infrastructure. In 2014, progress in implementing these were been reviewed by LifeSciences UK, the strategic partnership of the four industry bodies ABPI, ABHI, BIA and BIVDA. They noted that whilst there had been some strong successes, particularly the Biomedical Catalyst fund, in other areas progress has been slow or variable, such as the AHSNs.⁽³⁰⁵⁾

Accordingly, the report highlights that ‘it is vitally important that the government, the NHS and other agencies focus on and renew their collective energy to delivering the Strategy and its commitments’.

Three of the initiatives designed to bring different sectors together and maximise cross-sectoral support are highlighted here, but there are several more, including the UK Research Partnership Investment Fund, the Clinical Practice Research Datalink (CPRD), the NICE Implementation Collaborative and programmes implemented by the Scottish, Welsh and Northern Irish governments.

The ‘Biomedical Catalyst’

The ‘Biomedical Catalyst’ funding programme is a joint programme between the MRC and Innovate UK to provide catalytic financing to academic and SME-led projects with commercial potential to move more quickly from discovery to commercialisation. This funding is designed to bridge what has been described as the ‘valley of death’ between getting ideas out of the lab and into the marketplace. The two bodies have awarded £200m to over 250 companies and universities, leveraging a further £100m from industry since 2012.

Some of the projects funded include a universal flu jab against all strains of the illness; new approaches to antimicrobial resistance; gene therapy for Parkinson’s disease; the world’s first clinical trial of a stem cell voice box; and repurposing a cancer drug to treat rheumatoid arthritis. The initiative has widely been judged to be a success.

Cell therapy and precision medicine catapults

Innovate UK is supporting the path from research to commercial products through technology and innovation centres called ‘Catapults’. These are centres where UK businesses, scientists, and engineers work together on late-stage research and development, bridging the gap between UK businesses and world-class research facilities. The result is the transformation of high potential ideas into new products and services to improve people’s lives and drive economic growth. The Cell Therapy Catapult, located in state-of-the-art facilities on the 12th floor of Guy’s Hospital in London, has reviewed almost 200 academic and 300 industry leads since 2012 resulting in several projects.

A second life sciences catapult is being launched in precision medicine, an industry that’s projected to grow from £14bn to £50-60bn by 2020. The UK is not the only country investing in these technologies however, for example with President Obama launching the Precision Medicine Initiative with a \$215m investment in the 2016 US budget.⁽³⁰⁶⁾

AHSNs

Academic Health Science Networks (AHSNs) aim to improve population health outcomes by enabling universities, industry and the NHS to work together to speed up the implementation of cutting edge research into routine practice in the NHS. One of the AHSNs, UCLPartners, states as its purpose: “to translate cutting-edge research and innovation into measurable health and wealth gains for patients and populations – in London, across the UK and globally”. Their headline achievements have included work in reducing mortality from heart attacks and stroke, improving care for dementia, prevention of NCDs, and speeding up approvals for clinical trials leading to further investment from industry partners.

There are 15 AHSNs across England, each of them bringing together local hospital trusts with academic institutions and industry partners to provide innovative solutions to local healthcare challenges. The techniques and products developed through these partnerships can then be exported abroad to improve the quality of health across the world. This role is carried out in the other countries of the UK by Health Sciences Scotland, Health Research Wales and BioBusiness (including Northern Ireland and the Republic of Ireland).

MedCity

MedCity is a major new initiative modelled on the Tech City Investment Organisation, bringing together universities and industry in the ‘golden triangle’ of Oxford-Cambridge-London to develop a global centre for Life Sciences. The partners include the Universities of Oxford and Cambridge and the three London AHSNs: UCLPartners, King’s Health Partners, and Imperial College Academic Health Science Centre. Key initiatives in the project include:

- The £650m Francis Crick Institute in London, due to open in 2015 – a major European centre for medical research that will conduct ground-breaking medical research to understand the causes of diseases and find new ways to prevent and treat illnesses such as heart disease and stroke, cancer, and neurodegenerative diseases.
- The £212m MRC Laboratory of Molecular Biology (LMB) in Cambridge, housing around 600 scientists to work in the fields of virus immunity, nerve degeneration, and synthetic biology amongst others.
- The £21m bio-escalator in Oxford, joint funded by the government and industry, which will help life sciences companies in the region share technology and expertise, and to translate scientific research into commercial products.

The benefits of the research and product development as part of this initiative to improving health are projected to be huge, as is the benefit to the Life Sciences sector in the UK.

The ‘Northern Health Science Alliance’ (NHSA) is a similar initiative in the North of England, harnessing the expertise of the leading universities and NHS Hospital Trusts to create an internationally recognised life science and healthcare system.

Government funding for life sciences

In addition to the biomedical catalyst fund outlined above, there are a broad range of government funding sources available for the life sciences industry in the UK. The LSO lists funding sources in the UK under five categories:

1. **R&D funding:** funding for companies for specific projects focused on R&D, clinical trials and/or commercialisation of a product or process. Funding is available across the whole range of the R&D process, from research and design (21 sources), pre-clinical and prototyping (23 sources) and late development and clinical (8 sources).
2. **Knowledge transfer and skills:** funding for companies to enable transfer of expertise and knowledge from academics to companies or to increase workforce skills (18 sources).
3. **Investment funding:** loans or grants to start-up a company or to support investment in new assets (10 sources).
4. **Business development funding:** schemes to support growth of business in areas such as export or growth of existing products or services (21 sources).
5. **Academic – Industry collaboration:** funding to academics to support work in partnership with industry. Here too funding is available across the product cycle, from research and design (3 sources), to pre-clinical and prototyping (7 sources), to late development and clinical (4 sources) and others (5 sources).

The sources of funding include: the Research Councils, including the Medical Research Council (MRC), Biotechnology and Biological Sciences Research Council (BBSRC), the Engineering and Physical Sciences Research Council (EPSRC) and the Science and Technology Facilities Council (STFC); the National Institute of Health Research (NIHR); the Department of Business, Innovation and Skills (BIS), Innovate UK and the British Business Bank; Business Wales, Invest Northern Ireland and Scottish Enterprise; HMRC and others.⁽³⁰⁷⁾ It also includes non-UK government financing, including from the EU, the Wellcome Trust and the Royal Society. These all contribute to a strong funding base for developing and commercialising BioTech and MedTech products, as well as bringing together key partners including industry, academia, the NHS and not-for-profit actors. However, it was noted by interviewees that government funding does not and cannot fill the gap in long-term capital investment in UK life sciences.

The UK tax, regulatory and institutional environment

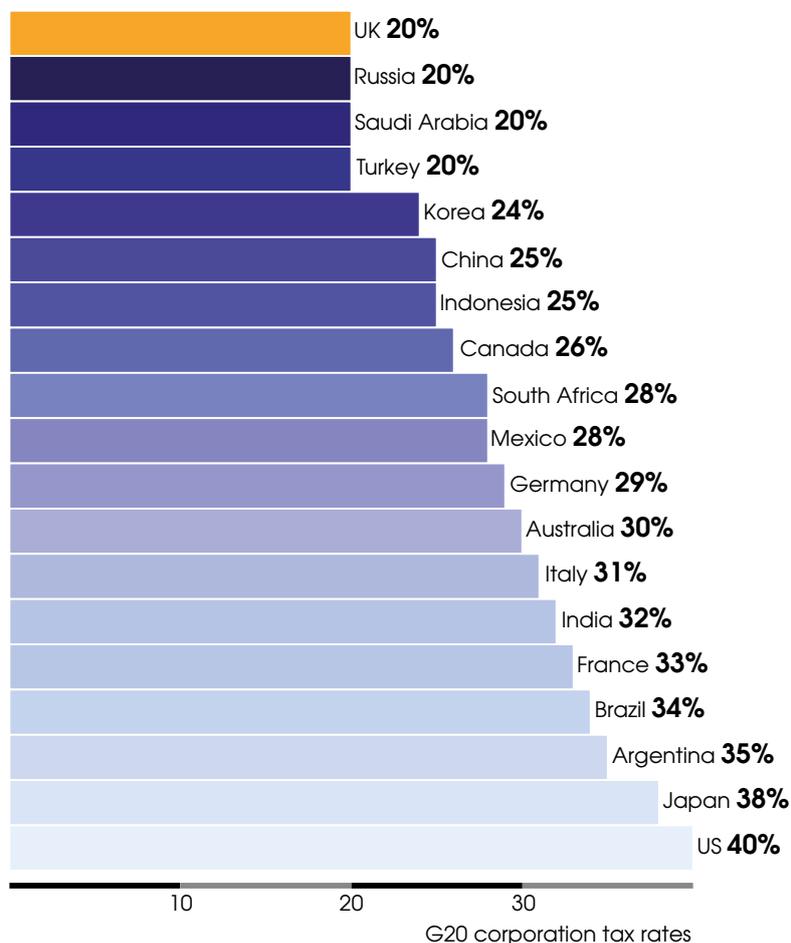
The KPMG Competitive Alternatives Report 2014 notes that across all sectors, the cost of doing business in the UK is 5.4% lower than in the US and the cost of doing R&D is 11.2% lower. This places the UK ahead of Germany, Australia, Japan, Italy and France.⁽³⁰⁸⁾ With regard to the life sciences sector, there are strong tax measures in place to incentivise investment in the UK, and a mixed regulatory landscape from the perspective of growing the sector.

UK tax policy

Three key taxation measures used by the government to provide support to the life sciences sector include lowering rates of corporation tax, corporation tax R&D relief and the Patent Box.

1. The UK corporation tax rate as of 1st April 2015 is 20%, the lowest in the G7 and G20, providing a strong incentive for investment.⁽³⁰⁹⁾ Whilst this has led to increased investment, this has to be balanced against the loss of tax revenue to the UK. The Institute of Fiscal Studies (IFS) has estimated the cost of bringing the rate down from 28% to 20% since 2010 to be £7.9bn in 2015-16.⁽³¹⁰⁾

Figure 55: G20 corporation tax rates as of 1st April 2015



Source: UKTIA guide to UK taxation, 2013

- Corporation tax R&D relief is designed to encourage companies to undertake their R&D activity in the UK. For large companies, for every £100 of qualifying R&D expenditure, the reduction in corporation tax is £130 – a 130% tax deduction; for SMEs, this reduction is £225 for every £100 of qualifying R&D expenditure – a 225% tax reduction.
- The Patent Box scheme was first announced in the 2009 Budget, and aims to encourage companies to commercialise their R&D in the UK. It therefore forms a complementary policy to the R&D tax relief, together encouraging investment in the UK from conception to commercialisation.

It involves a reduction in corporation tax from 20% to 10% on worldwide profits from inventions patented by the UK Intellectual Property Office, the European Patent Office and certain other offices. It has been credited with making a significant contribution to the resurgence of the pharmaceutical sector in the UK, with both GSK and AstraZeneca citing the scheme as critical for centralising their IP in the UK.⁽³¹¹⁾ Similar schemes exist in at least 10 other European countries.

However, the Office of Budgetary Responsibility estimates that when fully in place it will cost £1.1bn per year to run, and it has been criticised by the IFS for being poorly targeted and expensive, with a net loss to the exchequer. Additionally, following opposition to the UK Patent Box scheme led by Germany, in December 2014 the UK and Germany released a joint statement confirming that the current UK Patent Box regime will close to new entrants by 30th June 2016, and be abolished in 2021 to be replaced by a new Patent Box arrangement. The major change will be to restrict tax relief to profits generated from IP initially developed in the UK.

The UK regulatory and institutional environment

Strong environment for commercialising products

The UK has a world-leading intellectual property framework and strong institutions that provide investor confidence and support the life sciences sector to commercialise their products and get them approved. These include the Intellectual Property Office (IPO), Medicines and Healthcare Products Regulatory Agency (MHRA), the National Institute of Health and Care Excellence (NICE), the Health and Social Care Information Centre (HSCIC) and others. MHRA, NICE and HSCIC are discussed further in Chapter 2. In addition to these UK bodies, the European Medicines Agency (EMA) is based in London, as is the new EU Unified Patent Court responsible for life sciences, projected to bring in at least £200m to the economy each year and increase the attractiveness of the UK as a place to invest.⁽³¹²⁾

With regard to MedTech, the EU regulatory system for medical devices is recognised as providing the ‘gold standard’ globally, with EU citizens benefiting from advances in medical technology on average 3-5 years earlier than in Japan and 3 years earlier than in the US.⁽³¹³⁾ Over and above this, the UK is also ranked the most attractive market in the world in which to commercialise a medical device, ahead of the USA in 2nd place, and Germany in 3rd place.⁽²⁸¹⁾

Access to the NHS

Access to the NHS as the largest integrated healthcare system in the world was broadly viewed by interviewees as a strong asset. This was both as a research partner, and as a large single market for selling into. This was balanced against the strong price controls that limit the size of the domestic market compared to countries such as the USA, particularly for pharmaceuticals. However it was recognised that overall, these price controls are of clear net benefit to the UK public. Additionally, it was noted that some regulatory challenges in selling into the NHS remain, though it was also recognised that many of these regulations also protect patient safety and ensure cost-effectiveness, and therefore contribute to the overall quality of the NHS.

“ The NHS can buy at a scale that no other health system in the world can match – so it’s perfect for launching products, growing your business, and then getting to a place where you can export across the world ”

In 2011, the NHS published the report ‘Innovation, Health and Wealth: Accelerating Adoption and Diffusion in the NHS’, aiming to tackle some of the barriers to the adoption of innovations in the UK health system.⁽³¹⁴⁾ Despite some progress in this areas, some interviewees noted that the UK was still too slow to adopt innovative treatments, limiting its role as a launch country for medicines. In the USA, for example, the Food and Drug Administration (FDA) implemented the ‘Breakthrough Therapy Designation’ in 2012 to expedite the development and review of drugs where preliminary evidence indicates that the drug has substantial treatment effects in early clinical development.⁽³¹⁵⁾

More recently, significant progress has been made in this area. In 2014, the Early Access to Medicines Scheme (EAMS) was launched by the MHRA to fulfil a similar role to the US Breakthrough Therapy Designation. Drug companies are able to apply for 'promising innovative medicine' (PIM) designation prior to market approval, where there is clear, unmet clinical need and early evidence of effectiveness. This is then followed by a scientific opinion by the MHRA based on the available data, before a decision is made regarding making the drug available to patients.⁽³¹⁶⁾ The scheme has been designed with strong safeguards in place to ensure that patient safety is protected and has been welcomed by industry, but the Faculty of Public Health (FPH) and others have raised objections to the need for such a scheme and the overall value to patients.⁽³¹⁷⁾ 7 PIM designations have been awarded as of April 2015, and the first drug was made available to patients under this scheme in March 2015.

The EAMS complements the Adaptive Licensing pilot project launched by the EMA in 2014, providing an alternative route to licensing new medicines in select patient sub-groups with high clinical need, using a staggered process to ensure patient safety. It too has been welcomed by industry and research funders, though it remains in the pilot phase.⁽³¹⁸⁾ Most recently, the Government has also announced the 'Innovative Medicines and Medical Technology Review' to explore further ways to break down regulatory barriers to get innovative medicines and devices 'from the lab to NHS patients as quickly as possible'. In addition to benefiting NHS patients in the UK, this is also projected to have a positive impact on the attractiveness of the UK life sciences sector.⁽³¹⁹⁾

Regulatory framework for clinical trials

It has also been noted that the life sciences sector has suffered from a long-term decline in the attractiveness of the UK in clinical trials, a £30bn global industry that is strongly connected with R&D investment.⁽³²⁰⁾ The House of Commons Science and Technology Committee released a report in 2013 that noted that between 2000 and 2006 the UK's global share of patients in pharmaceutical trials fell from 6% to 1.4%, dropping from 3rd place (behind the US and Germany) to 9th place in the world. Between 2007 and 2011, the number of trial conducted in the UK dropped by 22%. This was noted to be due partly to the European Clinical Trials Directive (CTD), broadly recognised to have a damaging impact on clinical trials across Europe, and a challenging domestic regulatory and governance landscape.⁽³²¹⁾ With regard to the CTD, the MHRA has taken a leading role in shaping the new EU Clinical Trials Regulation which has received broad cross-sectoral support for how it has address the shortcomings of the CTD, though some reservations remain. With regard to the UK regulatory landscape, a number of initiatives have been implemented to streamline the process of trial approval and success. These include the establishment of the Health Research Authority (HRA) to bring together existing approval processes in one place, and re-launching the 'Clinical Trials Gateway' to provide patients with publicly accessible information on UK trials. The National Institutes of Health Research (NIHR) Clinical Research Network (CRN) also plays a crucial role in supporting commercial studies in the NHS.

Things have improved more recently, with the WHO International Clinical Trials Registry Platform showing that the UK has 22,192 registered trials, second in the world behind the USA (88,763 trials) and ahead of Germany (20,728 trials).⁽²⁴⁰⁾

Recent figures showing that the number of commercial phase II-IV trials increased by over 25% between 2011 and 2013, and in 2013/14 the median time taken to achieve NHS R&D approval for all sides halved to 26 days. The HRA has simplified approvals processes, and industry bodies have noted the significant shift in the domestic regulatory and governance environment.⁽³²²⁾ In 2013/14, over 99% of NHS trusts were involved in clinical research studies, with over 600,000 patients recruited.⁽³²³⁾ Scottish Development International have highlighted that 60% of Europe's preclinical testing takes place in Scotland.⁽³²⁴⁾ It was noted that the UK's growth is even more impressive in the context of competition from a growing number of actors outside Europe, including Brazil, Russia, India and China, leading to an overall fall in Europe's market share. Across all four sectors, the UK was also noted to have been a leader in transparency in clinical trials.

The UK Government, GSK and a broad range of academic and civil society organisations currently support the AllTrials initiative, launched in the UK in 2013. The AllTrials petition currently has over 84,000 signatories and 562 organisations as members.⁽³²⁵⁾ The petition calls for the registration and publication of full results and methods for all trials, past and present. This will make a strong contribution to the ability to make informed decisions about treatments to improve health across the world. In April 2015, the WHO published its Statement on Public Disclosure of Trials, clearly stating that all clinical trial results, past and present should be made publicly available.

Skills, migration and Europe

Reflecting the broader concerns of the Confederation of British Industry (CBI) and its members, the possibility of leaving the EU was highlighted as a major threat to the life sciences industry.⁽³²⁶⁾ The BIA, for example, have noted that 'Europe is the single biggest global market, and access to this market is a key reason for global biopharmaceutical companies deciding to establish their European HQ in the UK'.⁽³²⁷⁾ Additionally there was uncertainty over the impact on the EMA and the EU Unified Patent Office, as well as falling out of the EU common regulatory frameworks.

In common with the other sectors, there was also broad concern for the impact of immigration reform on the ability to attract highly skilled workers, particularly in Pharma and Biotech R&D, as well as skilled manufacturing and engineering. Given the centrally important role the university sector plays, failure to recruit the best students from overseas was also seen as contributing to this threat. This is discussed further in Chapter 3.

“ From an environment point of view we are getting to the end, we're getting right to a point where we don't have enough researchers in the country. ”

Academic sector support for the life sciences sector

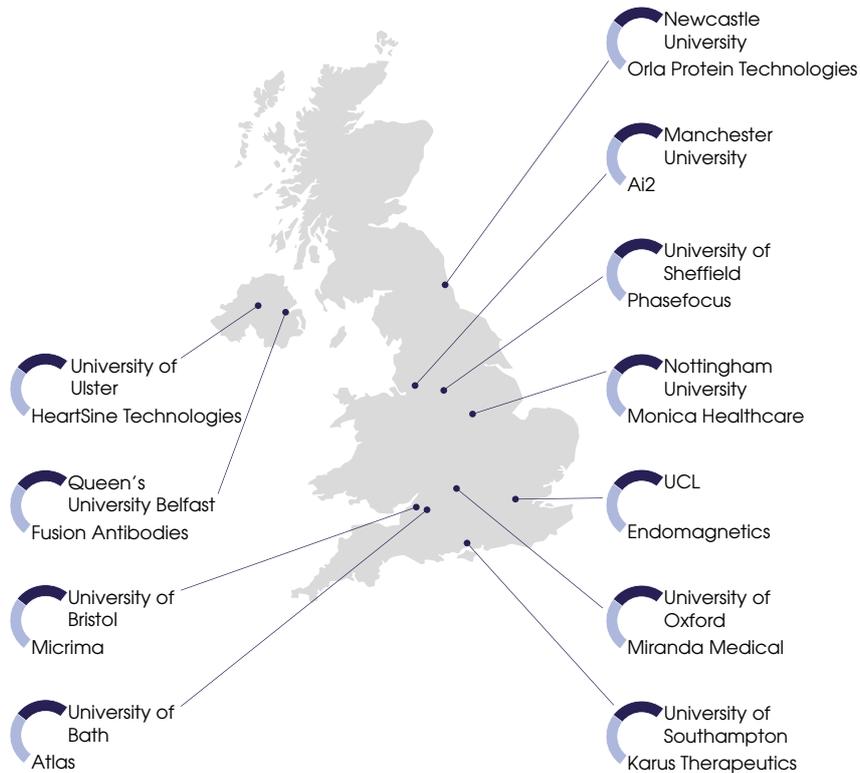
The UK is one of the leading global centres of research and academic expertise, from biomedical science to clinical research, to health services research. The strength of the academic sector relates directly to the strength of the commercial sector, both through providing the highly skilled workforce required, and through carrying out the early research that can then be translated into products that are commercialised and sold all over the world. In addition to universities, research funders such as the NIHR, Research Councils and the Wellcome Trust, together with think tanks

and their role in convening partners from across all sectors play an important role in providing a strong academic environment that supports the life sciences sector. Several examples of this have been discussed in this chapter and these actors are discussed further in Chapter 3.

“ The bulk of innovations will normally have originated from the university or an academic institution at some point. And so what is distinctive, relative to France or Germany, is that we’ve just got generally, higher quality universities that get better funded. ”

UK academic expertise in life sciences spans the whole of the UK. With regard to carrying out the early research, there are several examples of successful life sciences companies that are university spin-outs from across the country as shown in Figure 56.⁽³²⁸⁾ They also play a crucial role in supporting the commercialisation of research through Science and Technology Parks, discussed in the box below.

Figure 56: Map of university spin-out life sciences companies



Source: BVCA, Britain's Hot Talent 2014/15

Science and Technology Parks (STPs)

In the 1980s, long before national policies to bring actors together to work cross-sectorally, the first STPs were founded by UK Universities who set them up as centres of technological excellence and innovation to facilitate the commercialisation of research. In 1984 they came together to found the UK Science Park Association (UKSPA), whose membership has since grown from 5 to over 100 STPs across the UK. These contain over 4,000 companies, generating around 75,000 high-value knowledge economy jobs. These STPs bring together universities, companies, state actors and charities to encourage effective collaboration. Through the UKSPA, these actors are also able to collaborate across different STPs, increasing the potential of successful innovations.

Life sciences are just one of the areas that STPs work in, with numerous examples of successes across the UK. These include the Edinburgh bioQuarter; Cambridge Science Park and the Cambridge Biomedical Campus which is to host the recently announced AstraZeneca R&D and corporate HQ; and the Institute of Life Science in Swansea.

Comparing 'off-park' companies with those located on STPs, the latter were noted by UKSPA to have shown higher growth in revenue and employment, particularly qualified scientists and engineers and more inward investment. In addition to supporting companies to export overseas, the effectiveness of the STP model has also led to interest from foreign governments, with the UKSPA developing links with New Zealand, China and other countries in addition to hosting overseas members from these countries.⁽³²⁹⁾

Despite these successes, it was noted that the government has historically provided very limited support for Science Parks, and this has limited the potential for growth in innovation and product development through Science Parks.

Conclusions

Contribution of the commercial sector to improving health and shared prosperity across the world

1. **The UK commercial sector contributes to improving health across the world through:**
 - a. Healthcare companies providing expertise to support emerging economies that are increasing their spending on health to plan their health systems, as well as planning and implementing healthcare infrastructure and digital health projects in these countries and other high-income countries. This includes BUPA serving 22 million customers in 190 countries worldwide with health and care services, together with engaging in a hospital quality assurance programme to raise the quality of care in these hospitals.
 - b. Pharmaceutical and medical biotechnology companies playing a leading role in the research and development, and the manufacture and distribution of drugs and vaccines to over 170 countries in the world. These go on to save lives, improve the quality of life of patients with chronic diseases, and lead to better health outcomes globally. GSK has also played a leading role in increasing access to medicines in the poorest countries and supporting the move to increase transparency in clinical trials through supporting the civil society-led AllTrials initiative. This will benefit patient safety and the cost-effective use of healthcare resources across the world.
 - c. Medical technology companies playing an increasingly large role in developing and exporting medical technology products, contributing to improving the diagnostic and disease management capabilities in health systems around the world.
2. **This activity contributes to health and prosperity abroad, but also benefits the UK population through:**
 - a. More drugs and medical devices being commercialised and available for use in the NHS, with a strong regulatory framework ensuring that these are implemented cost-effectively.
 - b. Generating significant high-skilled employment and revenue, with the Life Sciences sector alone employing an estimated 183,000 people across the whole of the UK, and generating a turnover of over £55bn. Healthcare companies are also growing and exporting more year on year, bringing considerable benefits to the UK economy. One of the largest actors in this space, BUPA, generated £9.1bn in revenues and £637.8m in profit in 2014.

The commercial sector's weaknesses and vulnerabilities with regard to its contribution to improving health and shared prosperity across the world

1. **Certain weaknesses were identified that currently limit the contribution that the commercial sector can make, including:**
 - a. Despite having the leading financing environment for life sciences in Europe, the UK still lags behind the USA in this area. A consequence of this is that the three top American biotech clusters – Boston, San Francisco and San Diego – together have more than five times as many drugs in development as the UK. Additionally, there continues to be a gap in the availability of long-term

capital for life sciences companies, limiting their ability to commercialise their products and take them to scale in the UK for export around the world.

- b. The UK has had historic weaknesses in the NHS being slow to adopt innovative treatments and commercialise products; declining attractiveness of the UK as a site for clinical trials; and poor availability of start-up capital. Whilst measures have been put in place in the last 3 years to rectify these weaknesses, and major improvements have been noted, it is crucial for the continued growth of the sector that this level of support continues. Importantly, these reforms should not compromise patient safety or the quality of the approvals process, as these are key strengths of the UK that ensure a high standard of care in the NHS.
 - c. Despite the strong success of Science and Technology Parks to growth in the life science sector, this has come with limited government support for their work. Increasing government support would allow them to continue to drive collaboration, innovation and growth in the life sciences and other high-technology sectors.
2. **Additionally, looking ahead there were also threats that were identified to the commercial sector's ability to continue to take a strong role in health globally, including:**
- a. The knock-on effect of damage to the NHS's reputation domestically for healthcare companies' ability to do business abroad. If the NHS fails to live up to its international reputation for delivering quality healthcare cost-effectively, then it makes trading on the reputation of the NHS, which is what a lot of British Healthcare companies do, much more difficult.
 - b. The impact of immigration reform on the ability to attract and retain the best talent in life sciences, with the UK having a shortage of the high-skilled workers and graduates required to fuel the growth in the industry. Likewise, the possibility of leaving the EU represents a major threat for the life sciences sector. Many biopharmaceutical firms have invested in the UK due to its access to the EU which is the single largest market in the world. Additionally, the EMA and EU Unified Patent Office are based in London, and engagement has been key to growing the sector domestically.
 - c. Increasing global competition in both the healthcare and life sciences sectors. This is both from traditional high-income countries and from emerging economies in Brazil, India, China and others. These actors are taking an increasingly large role in life sciences, from R&D to manufacturing, particularly in the generics industry. Whilst this is a threat to the life sciences sector in the UK, it may ultimately lead to lower costs and increased access to medicines and health technologies for the poor.

The strengths and potential for growing the contribution of the commercial sector to improving health and shared prosperity across the world

1. **The strengths of the UK commercial sector that enable it to effectively contribute to improving health across the world include:**
 - a. A strong history and supportive policies for cross-sectoral collaboration between commercial actors, universities, charities and the NHS and other state bodies. These include the Science and Technology Parks that have been going for 30 years, together with more recent schemes such as the AHSNs and Catapults.

- b. Access to the world-leading UK university sector, both for supplying highly-skilled workers, and as research partners, with an increasing number of university spin-outs in the life sciences sector.
 - c. Access to the NHS as the largest integrated healthcare system in the world. This includes the NHS as a research partner with strong clinical expertise and a large number of volunteers for trials; a large purchaser of medical technologies to take them to scale; and a purchaser of healthcare industry services such as construction and IT services, allowing these companies to develop their expertise and take it abroad to benefit other countries. The reputation of the NHS as a provider of good quality, cost-effective healthcare has also contributed to healthcare companies being able to compete more effectively in the global marketplace.
 - d. A strong and growing financing landscape for life sciences companies, with the highest amount of capital available in Europe, 2nd only to the USA globally.
 - e. A strong regulatory, taxation and institutional landscape that encourages investment and growth in the life sciences sector. This includes strong cross-party support for the sector, and a favourable taxation, IP and regulatory framework. This has led to GSK, AstraZeneca and many other multinational pharmaceutical firms increasing their investment in the UK, and strong growth in the BioTech and MedTech sectors. The strong regulatory framework also ensures that products that are commercialised are safe and effective in improving health.
2. **Building on these strengths and looking ahead, there are several opportunities to grow the contribution of this sector to improving health across the world, including:**
- a. Increasing health spending across the world. Global healthcare spending is projected to rise by 5.2% per year, with the fastest growth in the Middle East and Africa at 8.7%, Asia-Pacific at 8.1%, Latin America by 4.6%, North America by 4.9% and Western Europe at 2.4%. India and China are expected to see rapid growth of 15.2% and 12.5% annually. This provides an opportunity for both the healthcare and life sciences sectors to increase their footprint in these countries, supporting governments to provide quality healthcare to their populations.
 - b. Emerging fields with the potential to transform people's health, including regenerative medicine, genomics and precision medicine. The UK has already invested heavily in these fields, but breakthroughs have the potential to make significant improvements in people's health, and generate significant revenue for the UK.
 - c. Building on GSKs leadership in transparency and access to medicines to make the UK a world leader in these two areas. This will lead to improved health across the world, but also increased revenues for UK companies through reaching a larger global population.
 - d. Aligning the work of Healthcare UK more closely with other state actors engaged in health, ultimately ensuring that actors across all four sectors support country-led programmes to achieve UHC through their relevant expertise.

5. The Not-for-Profit Sector

What do we mean by the 'not-for-profit' sector'?

The 'not-for-profit' sector includes actors that are outside the state sector who work on a non-profit basis to improve health across the world. They work through a combination of delivery of health services, capacity building of local actors, advocacy at the country and global level and funding and engaging in health research, as well as range of innovative approaches. This diverse range of actors and ways of working make a crucial contribution to health globally, both with regards to targeted actions to improve health in low and middle income countries (LMICs), but also through making significant contributions to medical and health research which has an impact in the UK and across the world.

These actors can be considered in three categories: non-governmental organisations (NGOs) who are engaged in improving health outside the UK such as Save the Children, Christian Aid and Islamic Relief; philanthropic grant-giving foundations who provide funding for health programming and research, both within and outside the UK such as the Wellcome Trust and the Children's Investment Fund Foundation (CIFF); and medical research charities who typically fund research for specific health conditions such as Cancer Research UK and the British Heart Foundation. These categories are not mutually exclusive and there is overlap between them, but they highlight the different ways in which actors in this sector work to improve health globally.

There are thousands of actors in the UK not-for-profit sector who are active in health across the world – each of them with a broad range of activities and geographic footprint. Accordingly, mapping the contribution that each of these actors make individually and capturing all the different ways in which they work is beyond the scope of this report. Instead, this chapter provides a high level overview of the footprint of the not-for-profit sector, using key examples to highlight the contribution that they make to health globally. A closer look at the activities of individual actors would reveal an even richer contribution than that described here.

Outline of chapter

As shown in Figure 57, the not-for-profit sector has three main areas. This chapter will consider each of them in turn, beginning with UK-based NGOs that work internationally, then moving onto grant-giving or philanthropic foundations and finally looking at medical research charities. For each area, their role in improving health will be described together with key data on the UK's activity and global reach, using case studies to highlight specific achievements and contributions. Finally, the chapter will conclude by bringing together the contribution of the not-for-profit sector to improving health and shared prosperity across the world, as well as the challenges and opportunities looking to the future.

Figure 57: Outline of the not-for-profit sector



UK NGOs that work to improve health globally

Overview

The World Bank notes that NGOs encompass a broad range of actors that are entirely or largely independent of government, not operated for profit, and exist to serve humanitarian, social or cultural interests.⁽³³⁰⁾ Despite these core features, it has been noted that many NGOs receive significant funding from governments and many generate profits that they reinvest in their activities, thus blurring these boundaries.⁽³³¹⁾ The broader sector includes large NGOs with an annual expenditure in the millions of pounds and small NGOs that spend a fraction of this; NGOs that work across multiple countries and community based NGOs and citizens groups; faith based and secular actors; and many other forms of NGOs. Health is a major focus of work for NGOs, but they work across a wide range of issue areas.

This section considers the contribution of UK NGOs to health globally, looking at charities registered in the UK with activity in health that extends outside the UK. These are widely recognised as important actors in the spheres of international development, humanitarian action, holding governments to account and many other areas of public action. They undertake a broad range of activities in health, from delivery of health services to capacity building, advocacy and research. Larger 'international NGOs' (INGOs) represent a major presence in many of the countries in which they work, receive significant sums from donors and are increasingly important and vocal actors in international agenda setting processes.

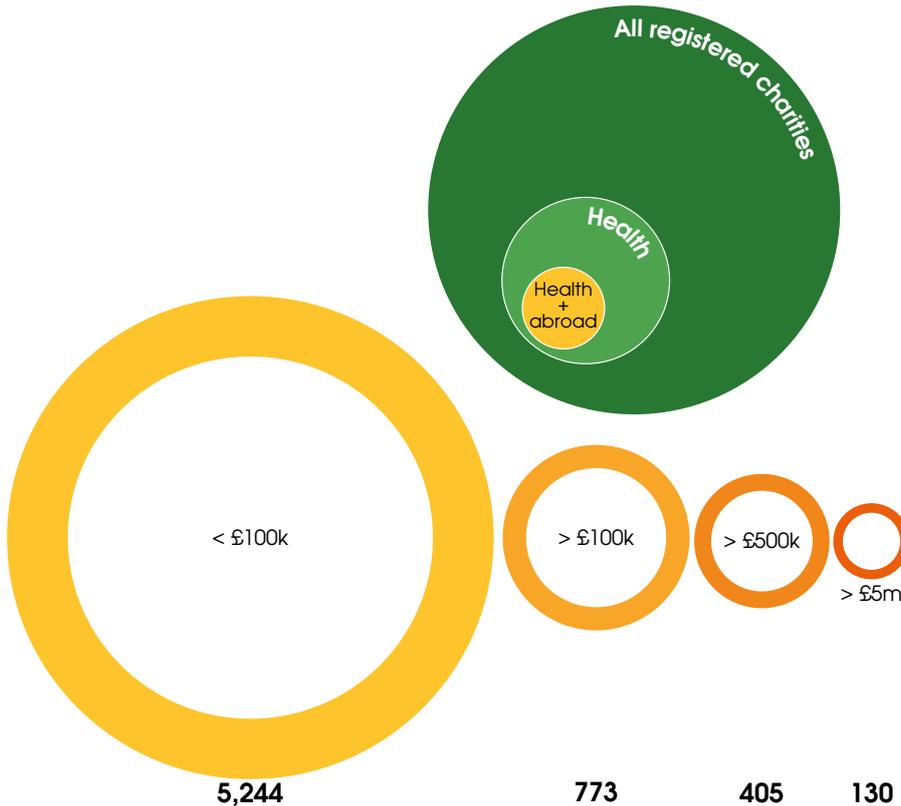
The UK charity sector

Over 820,000 people work in the UK charity sector, contributing over £12bn to UK gross value added in 2010.⁽³³²⁾ The Charity Commission is a government body that registers and regulates over 164,000 charities in England and Wales. The Scottish Charity Regulator (OSCR) regulates over 23,500 charities and The Charity Commission for Northern Ireland regulates over 7,000 charities in their respective nations. Together, these bodies ensure charities in the UK know what they have to do, the public knows what they do and they are held to account. The Charity Commission database of registered charities in England and Wales was analysed to look at the number of charities that report being active in health outside the UK, their ways of working and their geographic footprint.⁽³³³⁾ Scottish and Northern Irish charities are therefore not included in this analysis.

Numbers of charities active in health overseas

There are over 164,000 registered charities in England and Wales, of which over 27,000 report contributing to improving health and over 6,500 to health outside the UK. As illustrated in Figure 58, the vast majority of these have an annual expenditure of over £100,000, with 130 having an annual expenditure of over £5m.

Figure 58: Charities active in health abroad and their annual expenditure

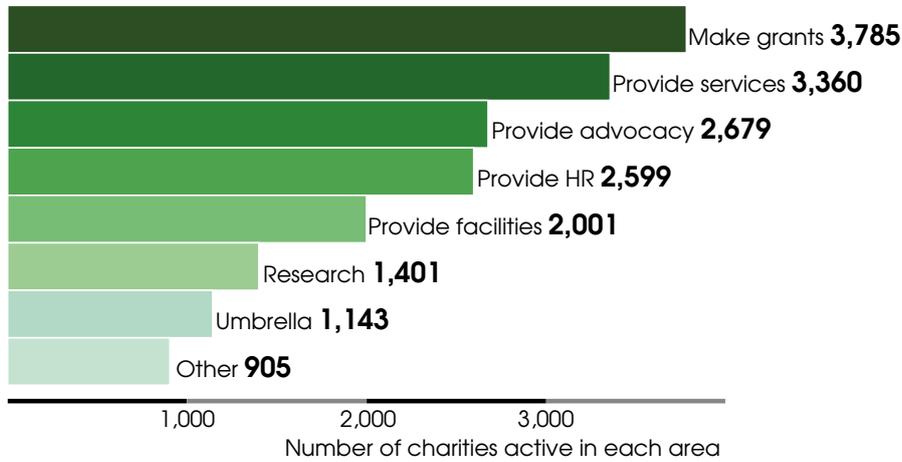


Registered charities active in health & abroad: total number & expenditure

Source: Charity Commission Register, 2014

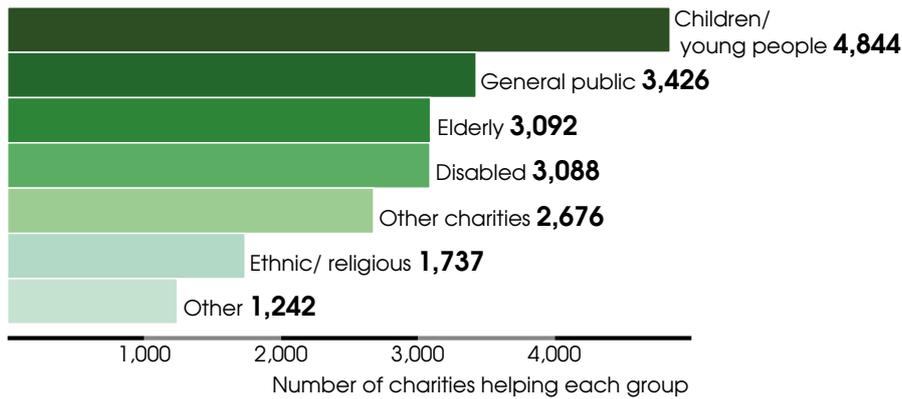
The Charity Commission also collects data on how charities work and who they help, illustrated in Figure 59a-b. These show that for charities active in health, grant giving and the direct provision of services are the most commonly cited activities; and children and young people are the core demographic focus. However, significant numbers of charities also cite engaging in advocacy and helping the general public, the elderly and the disabled as part of their work.

Figure 59a: Key activities of charities active in health abroad



Source: Charity Commission Register, 2014

Figure 59b: Key focus areas of charities active in health abroad

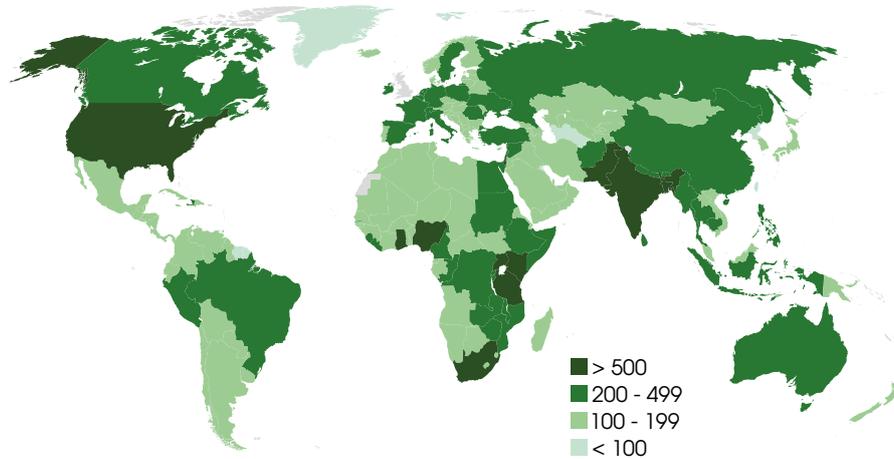


Source: Charity Commission Register, 2014

Geographic footprint

The geographic focus of these charities is in Anglophone LMICs and those with historic links (in addition to the USA where many of these also work or have offices). Figure 60 and Figure 61 illustrate this geographic footprint, based on data provided to the Charity Commission. Whilst this data doesn't indicate the impact of their activities or the scale of their financing within each country, it does show gaps and 'hotspots' of where these charities are active, with India, Kenya, Uganda, Pakistan and South Africa having the largest number of charities active in health. The larger INGOs have a truly global presence, for example Save the Children works in 120 countries across the world.

Figure 60: Geographic footprint of charities active in health overseas



Source: Charity Commission Register, 2014

Figure 61: Top 10 countries where charities are active in health

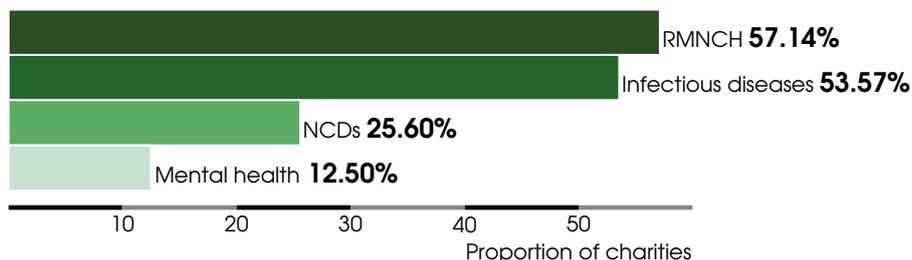
Rank	Country	Number of charities active in health
1	India	1,554
2	Kenya	1,054
3	Uganda	888
4	Pakistan	767
5	South Africa	699
6	US	619
7	Ghana	615
8	Bangladesh	613
9	Nigeria	605
10	Tanzania	576

Source: Charity Commission Register, 2014

Health sectors in which UK INGOs are active

Bond is the UK membership body for organisations working in international development or supporting those that do through funding, research, training and other services. It has over 400 members ranging from large agencies with a global presence to smaller agencies that work in specific countries or with specific communities. A top-level analysis of Bond members active in health looked at the health sectors in which they worked. The results are illustrated in Figure 62, showing that reproductive, maternal, newborn and child health (RMNCH) was a focus for the highest proportion, followed by infectious diseases, non-communicable diseases (NCDs) and finally mental health.⁽³³⁴⁾ The relatively small proportion of NGOs working on mental health mirrors the low priority afforded to improving mental health across all four sectors.

Figure 62: Proportion of UK INGOs active in each health sector



Source: Annual reports and websites of Bond member NGOs, 2015

Global standing of the UK NGO sector

Behind the numbers in the previous section, the UK has some of the largest and most influential NGOs in the world engaged in service delivery, capacity building, advocacy and research across the full spectrum of health. This extends from RMNCH (e.g. Marie Stopes International and Save the Children) to health of the elderly (e.g. Help Age International and Age International); from a focus on health systems strengthening (e.g. Health Partners International and Save the Children), to neglected tropical diseases (e.g. Sightsavers and Orbis), WASH (e.g. WaterAid and Practical Action) and mental health (e.g. Basic Needs and Minds for Health). Across the sector, 5 of the 11 largest INGOs have their origin in the UK.⁽³³⁵⁾

“ The UK has one of the largest, most diverse and most vocal NGO sectors in the world – this sets us apart from most other countries. ”

The ‘Global_Geneva 2015 Top 500 NGOs rankings’ surveyed over 2,000 NGOs focused on human welfare and human rights. NGOs were ranked on three critical areas: impact, innovation and sustainability. Additional points were allocated for independence, transparency, accountability and the quality of the returned questionnaire, and points removed for dependence on corporations, governments, single funders and other specified sources.⁽³³⁶⁾ The final rankings, illustrated in Figure 63, show that the UK has three of the top ten NGOs in the world, all of whom are active in improving health globally. The UK also has the second largest number of top 500 NGOs in the world (46) after the USA (130), but ahead of Switzerland (33), India (31) and Japan and the Netherlands (18).⁽³³⁶⁾

Figure 63: Global_Geneva Rankings Top 10 NGOs 2015

Rank	INGO	Country
1	MSF	France
2	BRAC	Bangladesh
3	Danish Refugee Council	Denmark
4	Grameen Bank	Bangladesh
5	Acumen Fund	US
6	Oxfam	UK
7	Partners in Health	US
8	Islamic Relief	UK
9	Save the Children	UK
10	World Vision	US

Source: Global_Geneva 2015 Top 500 NGOs Rankings

Key contributions of the NGO sector to improving health globally

As highlighted above, the UK NGO sector is highly diverse, both in the ways in which actors operate and the health sectors that they focus on. Interviewees commented that the UK NGO sector is internationally respected for the quality of its work, its experience and expertise across the whole range of health areas and its contribution to the global health policy debate. This section captures some of the key contributions of the sector to improving health globally, using a range of case studies to illustrate these. However, it is not exhaustive due to the sheer number of NGOs and the range of ways in which they work. In addition to the themes outlined here, UK NGOs including THET, VSO and UK-Med play a key role through supporting NHS health professionals to volunteer overseas, and this is described further in Chapter 2.

Responding to humanitarian disasters and conflict

Given their experience, global reach and ability to mobilise personnel quickly, UK NGOs have played an important role in addressing major health crises and emergencies around the world. These have included natural disasters such as the Nepal Earthquake and the Philippines Typhoon; conflicts in Gaza and the DR Congo; and disease outbreaks such as the Ebola outbreak in West Africa. During the Ebola outbreak, UK actors including Save the Children and UK-Med were a critical part of the UK's response as implementing partners for the government-led response, described further in Chapter 2. However, interviewees also noted that the outbreak also highlighted some clear gaps in the sector, such as the absence of a UK INGO that had experience in running frontline medical services such as MSF, limiting the speed and scope of the contribution that UK not-for-profit actors could make in this area.

Part of the strength of the UK's response to disasters is the Disasters Emergency Committee (DEC), a convening platform set up for collective fundraising for major disasters or emergencies. It brings together 13 leading UK INGOs that work in humanitarian aid to unite fundraising efforts.

DEC member INGOs

- Actionaid
- Age International
- British Red Cross
- CAFOD
- CARE International
- Christian Aid
- Concern
- Islamic Relief
- Oxfam
- Plan UK
- Save the Children
- Tearfund
- World Vision

Since 1963 DEC have run over 65 appeals raising over £1.1bn. Recent appeals include the Nepal Earthquake (£65m so far), the Ebola outbreak (£34m) and the Gaza crisis (£19m). In 2013, they raised £102m from appeals for the Syria crisis and the Philippines Typhoon, helping 1.7 million people including 663,000 with emergency food aid, 54,000 people with clean water and hygiene packages and 20,000 people with medical care.⁽³³⁷⁾

DEC member agencies work together to share information in the period leading up to an appeal launch, enabling them to assess the gravity of the disaster or emergency, and the probable level and effectiveness of any collective response. The network ensures information-sharing and joint monitoring of 'at-risk' countries, enabling members to benefit from each other's knowledge and to better prepare to help people. Following each crisis, they also engage in joint learning to improve the response in the future.

DEC also works closely with corporate partners when a disaster occurs to raise funds quickly and effectively. These include the major TV and radio broadcasters, technology partners to enable the rapid processing of hundreds and thousands of pounds of donations, and finance and retail partners. Working with these partners allows DEC to raise funds effectively and coordinate communications to ensure the public receives clear, consistent messages to generate maximum impact. Their approach has served as a model for similar networks across the world, and they are actively engaged in exporting this joint appeals mechanism to other countries.⁽³²³⁾

More generally the UK NGO sector was noted to have particular expertise in fragile and conflict-affected states – countries where NGOs will continue to play an important role in the delivery of essential services into the future. The nature of conflict and humanitarian work has shifted in recent years, though, with the number of attacks and kidnappings of aid workers rising. Significant progress has been made in adapting to these shifts, though further adaptation will be needed as new developments emerge.⁽³³⁸⁾

Influencing policy at home and abroad

An increasing number of UK NGOs are active in policy and advocacy at the national and international level. This is an observed trend across the sector as INGOs move further away from their traditional remit of service provision and into the political action arena, with many of the larger INGOs now having dedicated advocacy and lobbying units. Their legitimacy stems from their extensive global networks and reach into the communities with whom they work and their reputation for effective action at the country level. This allows them to play a critical role in ensuring that national governments and the international community balance economic interests with social justice and the right to health.

A key area in which UK INGOs have been hugely influential is universal health coverage (UHC), with Save the Children and Oxfam publishing a series of influential reports and lobbying at the national and global level to move the agenda forwards. One example of this is both organisations working together with the WHO, World Bank, Rockefeller Foundation, Management Sciences for Health and Action for Global Health to organise the first 'Universal Health Coverage Day' in December 2014. This brought together a coalition of more than 500 organisations from over 100 countries to urge governments to accelerate reforms to ensure that everyone, everywhere, can access quality health services without financial hardship⁽³³⁹⁾ The event garnered significant media attention with 177 stories in 36 countries, and global action with 48 events across 32 countries. These events play a critical role in advancing the UHC agenda, which will ultimately result in the availability of health services to people across the world regardless of their ability to pay. This will

also make a significant contribution to tackling poverty and stimulating economic growth. However, one criticism was that whilst larger INGOs are more 'professional', focused and effective at lobbying, they are becoming increasingly disconnected from the populations that they seek to help. This was particularly noted to be the case around the Post-2015 Development Agenda (sometimes referred to as the Sustainable Development Goals – SDGs).

“ I have been looking at MDGs turning into SDGs. My main issue on that has been that they are really good lobbyists – professional, focused, good messaging – but have neglected connecting people and civil society to the SDG process. ”

The UK was also noted to have a strong history in rights-based advocacy, particularly for vulnerable groups. This includes those suffering from stigmatised diseases such as leprosy (Lepra) and HIV/AIDS (International HIV/AIDS Alliance); and more broadly women and girls (Marie Stopes International) and children (Plan International and Save the Children).⁽³³⁵⁾

With regard to influencing UK policy, Action for Global Health (AfGH) UK brings together 50 UK-based NGOS seeking to achieve improved health outcomes globally. They work on a broad range of health issues with a focus on the quantity and quality of UK development assistance for health and the UK government's role in accelerating progress towards healthy lives for all, including through UHC and the Post-2015 Development Agenda. This platform serves as an effective mechanism to facilitate a more streamlined discussion and engagement between civil society and UK policy makers, bringing together the larger INGOs with smaller organisations that wouldn't otherwise have a strong voice in policy-making.

One example of the AfGH's influence on UK policy has been their role in the International Development Committee of the House of Commons launching an inquiry on Health Systems Strengthening (HSS). AfGH actively contributed to this inquiry on behalf of its members, and its submission was widely cited in the report and had a strong influence on its recommendations. These included urging DFID to use its expertise in HSS to demonstrate global leadership on this issue, including concrete recommendations for how to achieve this.

Many of UK INGOs also work on policy and advocacy to improve health and wellbeing in the UK, including Oxfam and Save the Children – using the expertise gained through working on international campaigns to increase the effectiveness of domestic policy advocacy.

Shifting power to civil society in the global South

It is increasingly recognised that as countries develop, many of the roles historically carried out by international NGOs should now be done by in-country actors. This includes strengthened governments providing essential public services and local civil society organisations having the capacity to advocate for social justice and human rights and to hold their own governments to account.⁽³⁴⁰⁾ Many UK INGOs have been at the forefront of challenging this traditional 'North-South' power dynamic, contributing to shifting the centre of gravity for decision making in global health and international development more widely.

The UK-based International HIV/AIDS Alliance is a notable example of an NGO that takes this approach. Its aim is to support community groups in countries most affected by HIV to deliver change through community action. The Alliance includes 40 organisations across the world known as 'Linking Organisations', who in turn support and develop thousands more local NGOs and community based

organisations working to tackle HIV/AIDS. In 2013, the Alliance enrolled 1.1 million people with HIV in lifelong treatment and care, and reached 1.2 million people with integrated HIV and sexual health or TB services.

The 'Linking Organisations' are often based in challenging contexts where resources are limited and the disease is highly stigmatised, and support from the Alliance allows them to target the most affected and marginalised groups. This includes supporting them to develop sustainable management and funding and to fight legislation that criminalises the people they're trying to reach.

The HIV/AIDS Alliance is highly respected in HIV/AIDS community and is widely viewed as an important and innovative model when it comes to civil society engagement which has applicability beyond the HIV/AIDS response.

“ They (The HIV/AIDS Alliance) have a model which is around building capacity and linking organisations and communities, which is the right model for the future ”

Innovative approaches to tackling health challenges

Interviewees noted that in addition to the significant numbers of NGOs engaging in traditional models of working to improve health globally, one of the key strengths of the UK NGO sector is the range of innovative approaches to tackling health challenges. Two key examples of this are BBC Media Action and International Health Partners.

BBC Media Action is the international charity of the BBC, reaching over 200 million people across 29 countries, with health one of their major focus areas. Many of these countries are fragile and conflict-affected states where the media is one of the few options available to reach marginalised groups. The core of their work in health involves producing and disseminating a mix of TV, radio, online and mobile media content to improve health and influence audiences, informed by their research. This includes: providing accurate and impartial information; enabling role modelling; developing more supportive social norms while challenging negative ones; building skills and self-efficacy; and providing opportunities for engagement between people and policy-makers. They work with local media houses where possible, and engage in capacity building of these organisations, governments and NGOs to use the media to improve the health of local populations. They also engage in community outreach to reinforce this work and reach excluded audiences, for example through print materials, discussion groups, street theatre performances, road shows and community events.

One example of their work was supporting UNICEF to deliver a polio vaccination campaign in Somalia where popular opposition to polio vaccination is strong, and in some cases violent. BBC Media Action produced a rapid mass media response using radio on the BBC Somali Service to reach communities and raise awareness about polio and demand for vaccination services. The impact evaluation found that the programme increased awareness and understanding of polio amongst parents and grandparents; led to listeners sharing the information with others or encouraging them to listen to the programme; improved the ability of health workers to communicate with communities; and led to listeners choosing to take the vaccination, get their children vaccinated and convince their relatives and friends to get vaccinated.⁽³⁴¹⁾

International Health Partners (IHP) is a UK-based NGO that is Europe's largest facilitator of product donations between healthcare companies and aid agencies, increasing access to medicines across the world. They have provided £127m of medical aid to over 100 countries, reaching 25 million people with lifesaving and life enhancing medication, working with 170 healthcare companies from across Europe.⁽³⁴²⁾ Through coordinating need and supply, they work to avoid the problem seen after the 2004 Indian Ocean Tsunami where over half the 4,000 tonnes of medicines donated needed to be destroyed because they were out-of-date, inappropriate or simply not needed.⁽³⁴³⁾ During major disasters they work closely with healthcare industry partners, the WHO and medical NGOs to provide emergency drugs, followed by filling gaps in supply during recovery and reconstruction. They have responded to over 25 disasters across the world since 2004. They also provide ongoing support to national health systems through coordinating donated medicines and building capacity in supply chain management and medicines management; and provide Doctors' Travel Packs of over 60 lines of essential medicines and supplies to support volunteering by UK doctors in LMICs.⁽³⁴⁴⁾

Tackling the lack of health information in LMICs

Tens of thousands of people in LMICs die every day, despite the local availability of low-cost interventions that could save their lives, simply because healthcare workers and caregivers don't have access to the information that they need. Examples of this include: 7 in 10 women giving birth in health facilities in Africa and South Asia are mismanaged, contributing to the more than 300 deaths per day from postpartum haemorrhage in LMICs; 7 in 10 children with malaria treated at home are mismanaged, contributing to 2,000 deaths every day in Africa; and a thousand children die from diarrhoea every day in India alone due to basic errors from parents and healthcare workers.⁽³⁴⁵⁾

Healthcare Information for All (HIFA) is a global campaign to tackle this problem, aiming to ensure that 'every person and every health worker will have access to the healthcare information they need to protect their own health and the health of those for whom they are responsible'. It is facilitated by the UK NGO Global Healthcare Information Network and brings together more than 13,000 health professionals, policy makers and those working with healthcare information from 2,500 organisations in 170 countries, interacting on five forums in three languages.⁽³⁴⁶⁾ The main funder is the British Medical Association (BMA), but other key UK organisations that support HIFA include the Lancet and the Royal College of Midwives.⁽³⁴⁷⁾

An independent evaluation found that HIFA was a successful, interactive, dynamic global network; members reported tangible gains to their knowledge in understanding and addressing health information needs; it had taken up opportunities for advocacy for healthcare information; and it had achieved considerable amounts given its limited budget, punching above its weight.⁽³⁴⁸⁾ More recently, it has also informed the WHO guideline on Taskshifting for Maternal and Newborn Health through its 2-year collaboration with the Norwegian Knowledge Centre for the Health Services, University of Toronto and the WHO Department for Maternal and Newborn Health. A member of the WHO Guideline Group noted that as the HIFA knowledge base evolves over the coming years, it has the potential to become a leading source of experiential data to help inform future international guidelines on a range of health issues.⁽³⁴⁹⁾

Coordination and transparency in the UK NGO sector

With the large number of INGOs working to improve health across the world, coordination remains a major challenge for the sector. This leads to gaps, duplications and difficulties for governments in planning the delivery of health and other public services. The Zambia-UK Health Workforce Alliance was developed as a model to tackle these challenges, and to support the requests by African health leaders for support to train and educate health workers in Africa. It brings together UK and Zambian governmental and non-governmental organisations engaged in health workforce development to align their activities and provide a focal point for their host governments.⁽³⁵⁰⁾ This ensures that UK support is more effective, less fragmented and aligned to the country's national priorities, significantly reducing the burden on host governments. Its success has led to the development of the Uganda-UK Healthcare Alliance, aiming to achieve similar goals in Uganda.⁽³⁵¹⁾ Despite these initiatives, interviewees noted that coordination is still a challenge for INGOs based in the UK and abroad, limiting the effectiveness of the contribution that the sector as a whole makes to improving health. The lack of consistent data across the sector showing where all actors are working and what areas of health they're working in also contributes to this challenge for coordination.

In addition to improving coordination, another aspect of NGO effectiveness is transparency, improving their accountability to stakeholders in the UK and to governments and beneficiaries in host countries. The UK has led the world in improving transparency across the state and not-for-profit sectors, with UK INGOs leading the field globally. Of 340 organisations publishing aid information under the International Aid Transparency Initiative (IATI), 201 (59%) were UK organisations of which 167 were INGOs. This is partly due to funding requirements from DFID and partly due to proactive work from the sector itself including support from Bond.⁽³⁵²⁾ However, the coverage of this data remains partial, and the extent of information varies between NGOs.

Engaging in corporate partnerships to deliver results

There is a growing recognition in the NGO sector that multisectoral working and investment can make an important contribution to tackling poverty and health challenges across the world, including working with businesses. Many of the large health INGOs in the UK work with corporate partners, including Save the Children (24 corporate partners), Plan UK (19 corporate partners), CARE International UK (9 corporate partners) and Oxfam (6 corporate partners and additional corporate donors). These partnerships support NGOs, through fundraising; providing pro-bono accountancy, legal and professional services (support 'in-kind'); and providing sector-specific skills and expertise to work towards shared goals. The latter model moves beyond the traditional 'corporate philanthropy' relationship towards a mutually beneficial partnership that leads to sustainable results.

An example of this is the £15m GSK-Save the Children partnership, launched in 2013. This combines their expertise, resources and influence to tackle the specific needs in child health in LMICs with the aim of saving one million children's lives. The focus is on developing new medicines for maternal and child health and widening vaccine coverage in hard to reach communities; increasing investment in training healthcare workers; and researching new, affordable nutritional products to help alleviate child malnutrition. One output of this partnership has been the reformulation of an antiseptic used in mouthwash into a gel for cleansing the

umbilical cord stump of newborn babies to prevent serious infection, and there are many more products in development. GSK also gain access to markets in fast growing countries where healthcare spending is rising rapidly, resulting in a benefit to their 'core business'.⁽³⁵³⁾

This model has been subject to criticisms though, particularly with regard to the conflicting agendas of maximising profit versus targeting the poorest, which some see as irreconcilable. Additionally, there is a reputational threat for NGOs working with corporate partners in certain sectors. Nonetheless, proponents note that as long as both partners engage with a clear business case, are honest about their objectives and carry out appropriate due diligence, this model can leverage the strengths of both sectors to contribute to improving health globally. Interviewees also noted that through these partnerships, NGOs can also support cultural shifts in the approach of corporate actors to the poorest and most marginalised groups.

How DFID supports the NGO sector to improve health

With the UK positioned as the 2nd largest donor in the world and the aid budget fixed at 0.7% of GNI, DFID provides a reliable source of funding for many NGOs as implementing partners. Because the UK's aid is 'untied' from UK goods and services, this funding goes to both NGOs based in the UK and those based overseas, depending on who the most effective delivery partner is. This increases the value for money of aid spending for the UK, and promotes ownership of aid programmes by recipient countries. In 2013/14, 16% of DFID's bilateral programmes in countries were carried out by civil society organisations, ranging from a very small proportion of total country programming to approximately half the total expenditure – with higher proportions seen in fragile states.⁽¹⁴⁰⁾ This was an increase in funding to NGOs by one-third from the previous year, taking the total to £1bn.⁽³³⁵⁾

In addition to bilateral programme funding, DFID funds NGOs to improve health through schemes including:

- **UK Aid Match:** match-funding of public donations for charity appeals for projects to reduce poverty in developing countries. The scheme provides up to £120m in grants between 2013-16, with at least £1m per year reserved for small organisations. Match funding for appeals that improve health have been allocated to Age International, CAFOD, Christian Aid, Islamic Relief, Save the Children, Sightsavers, WaterAid and others.⁽³⁵⁴⁾
- **UK Aid Direct:** Up to £30m in the first round of funding to support small and medium sized NGOs working to tackle the health Millennium Development Goals (MDGs), with a specific focus on Sexual and Reproductive Health and Rights (SRHR). Future funding rounds may be allocated to other areas of global international development priorities.⁽³⁵⁵⁾
- **Rapid Response Facility:** Providing immediate funding to approved NGO partners to respond to humanitarian emergencies and conflicts.⁽³⁵⁶⁾

Whilst the availability of a reliable source of funding from DFID was viewed as a strength of the sector, some interviewees noted that the reliance of the UK INGO sector on DFID funding made it more difficult for them to speak openly, limiting their ability to challenge government policy.

Future challenges for UK INGOs

The Bond report 'Fast Forward: The Changing Role of UK-based INGOs' found seven 'megatrends' that will see a profound shift in the way context in which INGOs will work.⁽³³⁵⁾ These were:

1. Climate change, and the need to integrate the consequent shifts into programming
2. Demographic shifts, for example the proportion of older people living in developing countries rising from 62% today to 80% in 2050
3. Urbanisation, and the need to both improve understanding of working in the urban context and ensuring the rural poor are not neglected
4. Natural resource scarcity, high commodity prices and the turbulence that these will generate Geopolitical shifts from the 'West and North' to 'East and South' and the need to work more closely with counterparts in the global South
5. Technological transformation and innovation, and the need to engage with the potential that this brings
6. Inequality, and the important role of global civil society in challenging this

For INGOs active in health, these are all of high relevance looking to the future. Examples of this include climate change leading to a shift in the pattern and spread of diseases and changes in food systems; demographic changes leading to a shift in the health needs of populations in LMICs; and technology providing new routes into improving health in low-resource UK NGOs will have to take these trends into account as they seek to continue to tackle health challenges in LMICs.

The Foundation Sector

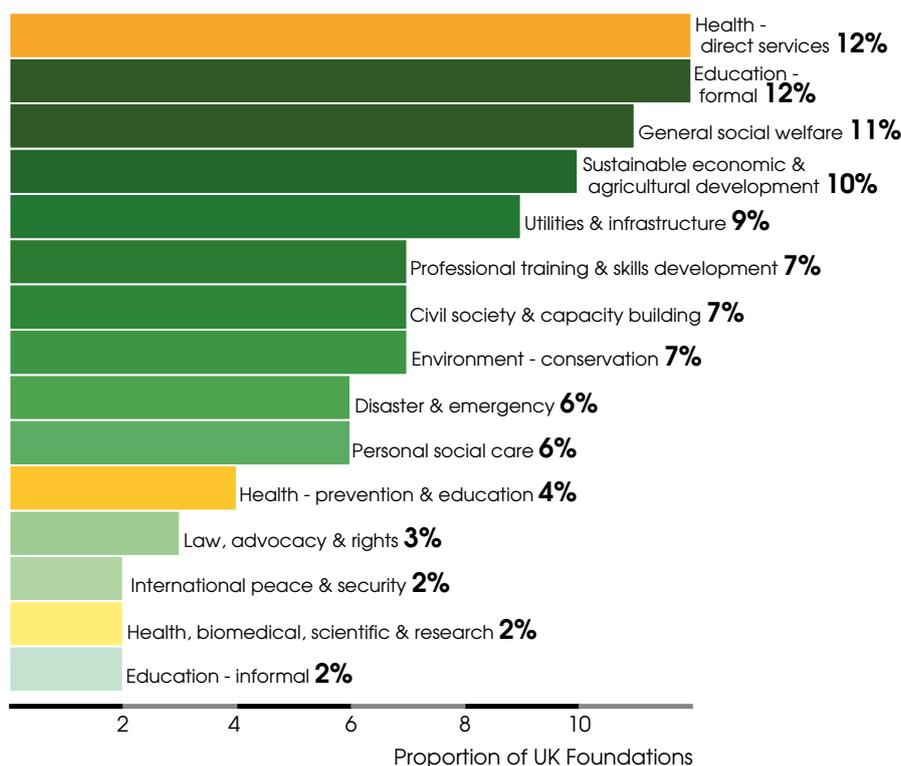
Overview

Foundations are defined here as 'independent grant making organisations whose income derives mainly from private sources.'⁽³⁵⁷⁾ There are an estimated 10,000 foundations registered in the UK - the vast majority of which are small family-run organisations. The sector is highly skewed, with the top 300 foundations accounting for 90% of the value of all giving. The Wellcome Trust is the UK's largest foundation, spending over £727m on health research and related activities in 2014 and accounting for approximately one-fifth of all giving from foundations.⁽³⁵⁸⁾ Other large foundations active in health overseas include the Children's Investment Fund Foundation (CIFF) which spent \$63m on health and nutrition in LMICs in 2014, and Comic Relief which spent £16.9m on health in LMICs in 2013/14.^(359, 360)

Taken as a whole, 14% of total private giving to charitable activities is contributed by foundations.⁽³⁵⁸⁾ With regard to large donations, foundations are the key player in the UK – 61% of the ‘million pound plus’ donations in the UK in 2013 were gifted by foundations (in contrast to 19.5% by individuals and another 19.5% by corporations).⁽³⁶¹⁾ Grant making levels across the UK foundation sector grew by 9.8% in real-terms in the 18 months leading up to March 2013. This rate of growth is nearly double that of foundations in the US (a country renowned for the strength of its philanthropic sector). At the same time however, the net assets of UK foundations have seen dramatic fluctuations over recent years, especially following the financial crisis. New donations to foundations fell by nearly 10%, in 2013 highlighting the potential vulnerability of the sector.⁽³⁵⁸⁾

It is estimated that UK foundations give around £292m annually to international development activities each year.⁽³⁵⁸⁾ A significant proportion of this is spent on health, with Figure 64 illustrating that health-related activities are the most popular area of funding for UK foundations.⁽³⁵⁷⁾

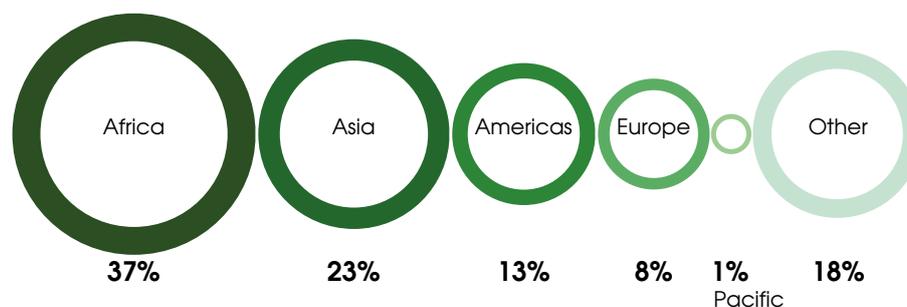
Figure 64: Proportion of UK foundations funding different areas of international development



Source: Pharoah C, Bryant L. Global grant-making: A review of UK foundations' funding for international development, 2012

With regards to geographic focus, Figure 65 illustrates that UK foundation sector's footprint mirrors that of the UK's bilateral aid and of UK INGOs. East Africa is the area of the greatest funding interest for foundations followed by South Asia. More limited activity is directed to regions such as Latin America and the Pacific.⁽³⁵⁷⁾

Figure 65: Estimated allocation of UK foundation funding by region



Source: Pharoah C, Bryant L. Global grant-making: A review of UK foundations' funding for international development, 2012. 'Other' refers to 'developing countries in general' or 'global'

There is a strong link between UK foundations and the NGO sector, with foundations channelling the majority of their funding for programming in LMICs through NGOs. UK foundations do fund countries directly where there are strong pre-existing country relationships and knowledge, and there is an emerging trend for country partnerships to build local capacity rather than funding INGOs.

Grant making via foundations is significant not just in terms of the monetary value, but also because foundations typically have the freedom to challenge boundaries in ways that the commercial or public sector actors are unable to do. This stems from the freedom from political and budgetary cycles, accountability and bureaucratic constraints that governments and other actors are subject to, allowing them to commit to long-term funding and bold and innovative approaches. This is a key strength of the sector, exemplified by the ability of the Children's Investment Fund Foundation (CIFF) to undertake an 11-year programme to eradicate parasitic worms in Kenya – something that would have been very difficult for a donor government to fund.⁽³⁶²⁾

In line with this, interviewees noted that UK foundations are renowned for their long-standing relationships with local governments and local institutions, in some cases nurtured over decades, and this was seen a comparative strength compared to some of the larger but newer US based foundations. Interviewees noted that international foundations are now looking to the UK to understand how to build these relationships.

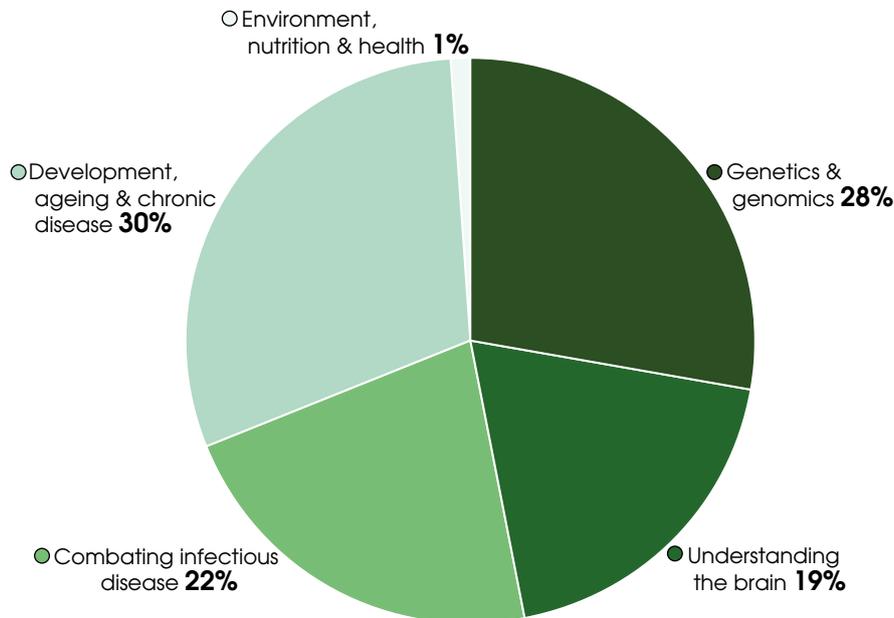
“ Many of the major American foundations have not invested in infrastructure in the same way ... so they have had funded hundreds of projects across the whole world and then after the funding went out, three years later those little centres would disappear ” .

However, the UK foundation sector remains very small in financial terms compared with the USA, despite the strength of London as a major global financial centre. The Association of Charitable Foundations found that the US system is a unique product of social, political and historic factors and cannot be replicated – for example the absence of an organised welfare state as it exists in the UK.⁽³⁵⁸⁾ A consequence of this is that NGOs in the UK are far less dependent on a small number of donations from high-value individuals, instead relying on smaller donations from a much larger body of the public.

The Wellcome Trust

The Wellcome Trust is the 2nd largest charitable foundation in the world after the Bill and Melinda Gates Foundation, and the largest non-governmental funder of medical research in the UK. The total charitable funds in 2013/14 stood at £16.7bn, with an expenditure of over £727m on charitable activities related to health. This included £453.1m on the whole spectrum of health research, from fundamental science to health systems; £74.9m on applied research to bridge the gap between science and commercial applications; £75.6m on the historical, ethical, social and cultural contexts of science; and £124.1m on the Wellcome Trust Genome Campus where the Sanger Institute is based. Health research spending is divided into five 'primary challenge areas' of: genetics and genomics; understanding the brain; combating infectious disease; development, ageing and disease; and environment, nutrition and health.⁽³⁶³⁾ The breakdown of funding between these areas is illustrated in Figure 66.

Figure 66: Wellcome Trust grant funding by 'primary challenge area'



Source: Wellcome Trust Annual Report and Financial Statements 2014

Research outputs from these areas contribute to improvements in health in the UK and across the world. Examples of this include the contribution that the Wellcome Trust has made to genomics, investing £740m between 1990 and 2009; its contribution to tackling malaria, investing £189m between 1990 and 2009; and its co-funding of clinical trials for an Ebola vaccine at the Jenner Institute at the University of Oxford with the MRC and DFID together with rapid research during the outbreak.⁽³⁶³⁻³⁶⁵⁾ These are discussed further in Chapters 1 and 2.

The Wellcome Trust has a growing portfolio of funding in global health research, focused on supporting researchers and institutions where research can flourish in LMICs, as well as funding research that strengthens local infrastructure and tackles health issues that are national priorities in those countries. Part of this work is carried out through their 'Major Overseas Programmes', including: the Wellcome Trust-Mahidol-Oxford Programme in Thailand and Laos; the Vietnam Programme; the KEMRI-Wellcome Programme in Kenya; the Malawi-Liverpool-Wellcome Programme in Malawi; and the Africa Centre for Health and Population Studies at

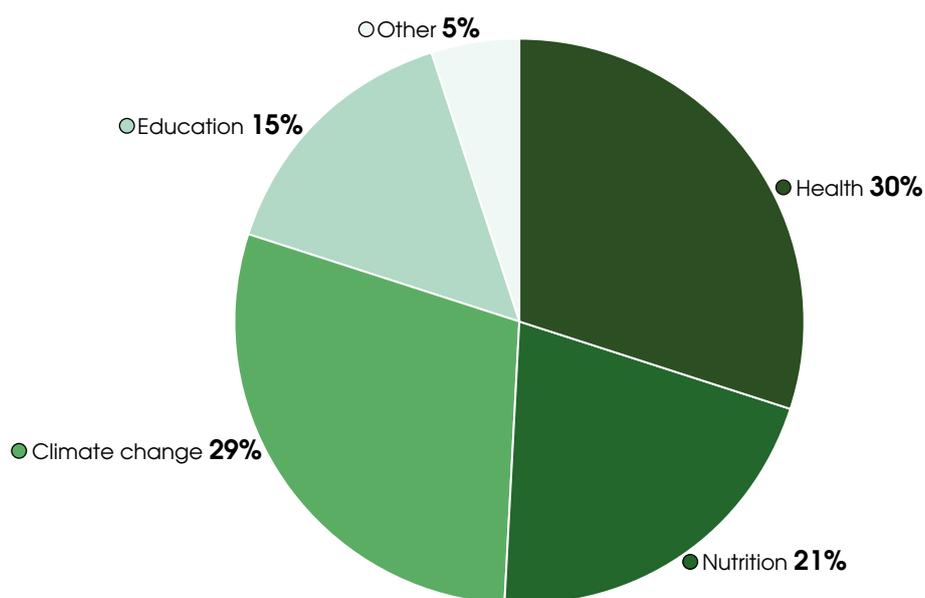
the University of KwaZulu-Natal in South Africa. These focus on tackling healthcare challenges in those regions, from infectious disease threats such as malaria and HIV to NCDs.⁽³⁶⁵⁾

Wellcome also has a broad range of funding streams for researchers in LMICs, from fellowships for researchers at all stages of their training to specific programmes in partnership with other research funders. These are discussed further in Chapter 3 together with the strengths of the academic sector in collaborative working and building equitable partnerships with institutions in LMICs, an area where the Wellcome Trust has played a key role.

The Children's Investment Fund Foundation (CIFF)

The Children's Investment Fund Foundation (CIFF) is a UK-based foundation which aims to improve the lives of children living in poverty through achieving large-scale sustainable impact. It was established in 2003 and now has an independent endowment of over \$4bn, spending \$122m in charitable grant funding in 2013/14, up 48% on the previous year. It's breakdown of charitable grant funding across areas is illustrated in Figure 67, showing that the highest priority is health (\$37m), followed by climate change (\$35m), nutrition (\$26m) and education (\$18m).⁽³⁵⁹⁾

Figure 67: CIFF spending by sector



Source: CIFF Annual Report 2013/14

Their three priority areas in health are child survival – ensuring every birth is safe and every woman and her child survives and thrives; paediatric AIDS – working to end paediatric AIDS by preventing mother-to-child transmission and treating all infected children; and adolescent health – ensuring that no girl dies or suffers mental or physical injury as a consequence of pregnancy. Their work on nutrition also directly relates to improving health, with undernutrition the underlying cause of 45% of child deaths.

As measuring the impact of funding and programmes has become more prominent in international development, actors are moving from tracking 'amount of funds disbursed' to trying to assess 'lives saved' or 'deaths prevented'. CIFF has a strong reputation in the field for leading the way in this area, focusing on the impact of their programmes and the opportunity cost of every pound spent; using third-party evaluations to assess impact; and being willing to close down programmes that are not achieving results. In order to ensure this, they work very closely with their delivery partners on programme management and course correction, taking the view that the work starts once the grant has been issued. This contrasts with the traditional approach taken by foundations of focusing on assessing the quality of the grant application and then leaving recipients to manage the programme according to the agreed terms. However, CIFF's approach has been questioned on the grounds of whether they are 'too rigorous' and if the model is sustainable, as their demand for data and accountability places a large burden on recipients.

“ We do look for a measurable return on our investment and that leads us to a very deliberate focus on a rigorous analysis of the investment opportunity combined with a really rigorous analysis of whether we can deliver them at scale or not ”

Their evaluations have shown a broad range of successful results, including: improved HIV testing and treatment leading to mother-to-child transmission rates falling from 28% to 5.4% in Zimbabwe, preventing over 37,000 new infections and saving over 13,000 children's lives; treating over 250,000 children for acute severe malnutrition of which 81% were cured, saving an estimated 24,100 lives in 12 months; and a 26% reduction in mortality using an innovative community health worker model, comprising a network of women entrepreneurs offering free diagnosis and treatment and selling consumer goods to keep the model financially viable.⁽³⁶⁶⁾

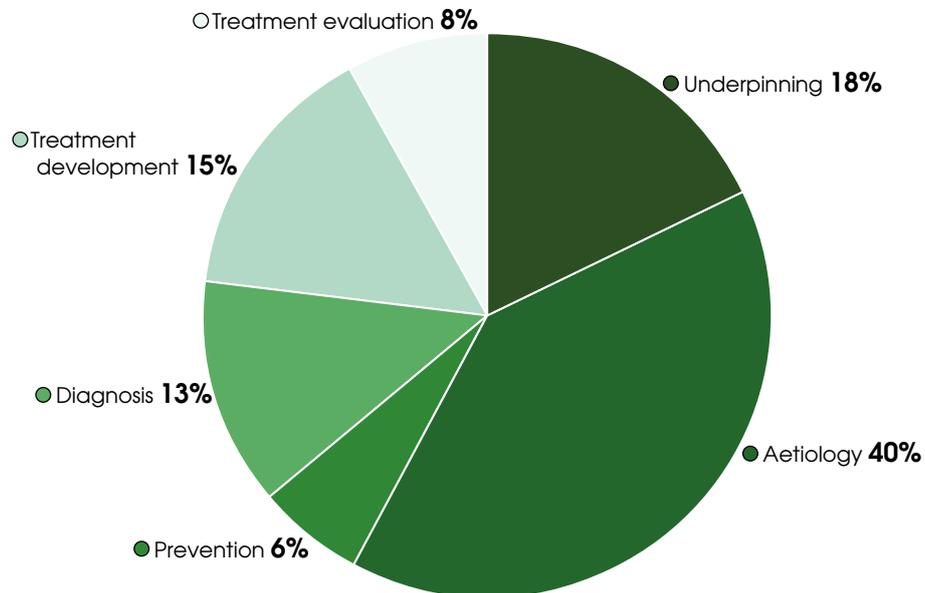
Medical Research Charities

Medical research charities in the UK

Medical research charities play a central role in funding medical research in the UK, contributing to the discovery of new treatments and approaches to preventing and managing diseases that benefit patients in the UK and across the world. These charities also play a key role in engaging in evidence-based advocacy to inform government policy on medical research, ensuring this remains high on the political agenda. They also engage in a range of other charitable activities, including welfare, support care, education and information – supporting the public to make more informed decisions. These charities are also often funded by patients, care givers and their networks, giving patients a more active voice and influence in the way health research is carried out in the UK.

The Association of Medical Research Charities (AMRC) is the national membership organisation of leading medical and health research charities, with 136 member charities spending £1.3bn in 2013 on medical and health research. This accounted for over one-third of all publicly funded medical research in the UK in 2013, though spending has not returned to its pre-recession levels of 2008.⁽³⁶⁷⁾ The proportion of funding spent on each stage of research is illustrated in Figure 68, showing that aetiology (causation of disease) was the largest area of focus, followed by underpinning fundamental science and treatment development.⁽³⁶⁸⁾

Figure 68: Stage of research funded by medical research charities in the UK



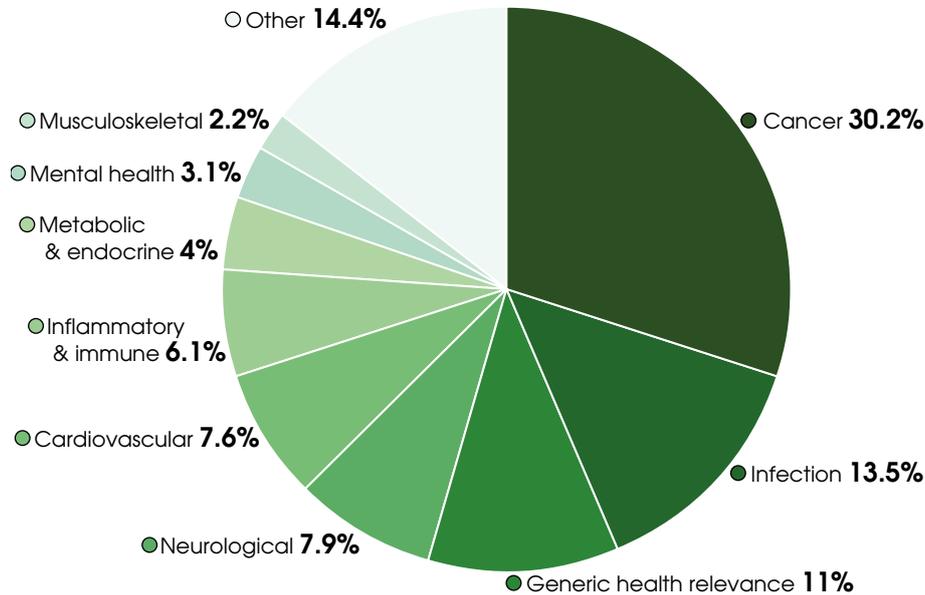
Source: AMRC, Charities' contribution to medical research, 2014

The proportion of funding spent on different disease areas is illustrated in Figure 69, showing that cancer was the largest area of focus, followed by infection, generic health relevance, neurological disease and cardiovascular disease.⁽³⁶⁸⁾

The focus on cancer is reflected in the UK medical research charities with a research spend of over £5m, which are:

- Cancer Research UK (see below)
- British Heart Foundation
- Leukaemia and Lymphoma Research
- Alzheimer's Society
- Alzheimer's Research UK
- Arthritis Research UK
- Breast Cancer Campaign
- Diabetes UK
- Great Ormond Street Children's Charity
- Parkinson's UK
- Prostate Cancer UK
- Yorkshire Cancer Research

Figure 69: Area of disease research funded by medical research charities in the UK



Source: AMRC, Charities' contribution to medical research, 2014

A key aspect of the UK medical charity sector is its strength in collaborations with the NHS, academia and industry. In 2013, medical research charities funded research in 364 different institutes, universities and NHS facilities across the UK. 91% of all charity funded research takes place in universities, 30% of non-commercial research in the NHS is funded by charities and 37% of government funded research receives follow-on funding from charities.⁽³⁵¹⁾ In addition, many medical research charities work in partnership with industry to support the translation of scientific discoveries into drugs and diagnostics. One example of this is the Medicines Acceleration Programme. This brings together a range of charities and medical research funders with the pharmaceutical industry to identify existing projects that have been stalled or shelved, and to invest in them to find new treatments for neurodegenerative diseases. These diseases affect over 50 million people across the world, and many have limited treatments available or no treatment at all.⁽³⁶⁹⁾

The government also supports the work of medical research charities through the Charity Research Support Fund. This provides approximately £200m per year to universities to fund the indirect costs of charity funded research. This includes costs such as the maintenance of laboratories, lighting and heating – necessary costs in carrying out research. This allows the charities to spend the money on what their donors expect it to be spent on – medical research – and allows the universities to cover the cost of conducting the research. In England, this provides universities with up to a 26% uplift in the funds they receive from charities, playing a crucial role in facilitating medical research.

Cancer Research UK

Cancer Research UK (CRUK) is the world's leading cancer research charity, spending over £350m on researching over 200 different types of cancer in institutes, hospitals and universities across the UK in 2013. They fund over 4,000 scientists, doctors and nurses to carry out this research. CRUK also spent £21m on providing information to patients, raising awareness of risks and symptom and influencing health policies.

This research has made a significant contribution to the doubling of cancer survival rates in the UK in the last 40 years. One example of this is their research into breast cancer, with the 10-year IBIS-1 trial showing that in women with increased risk of breast cancer, preventative use of the drug tamoxifen reduces the risk by 38%; and the IBIS-2 trial showing that high-risk post-menopausal women can reduce the chances of developing breast cancer by more than half by taking the drug anastrozole for five years.

CRUK has also contributed £45m towards the Francis Crick Institute discussed further in Chapter 3. This will be Europe's largest biomedical research institute when it opens in 2016, bringing together six of the UK's leading medical research organisations and 1,200 scientists, engineers, doctors and mathematicians to tackle cancer and other major diseases.⁽³⁷⁰⁾

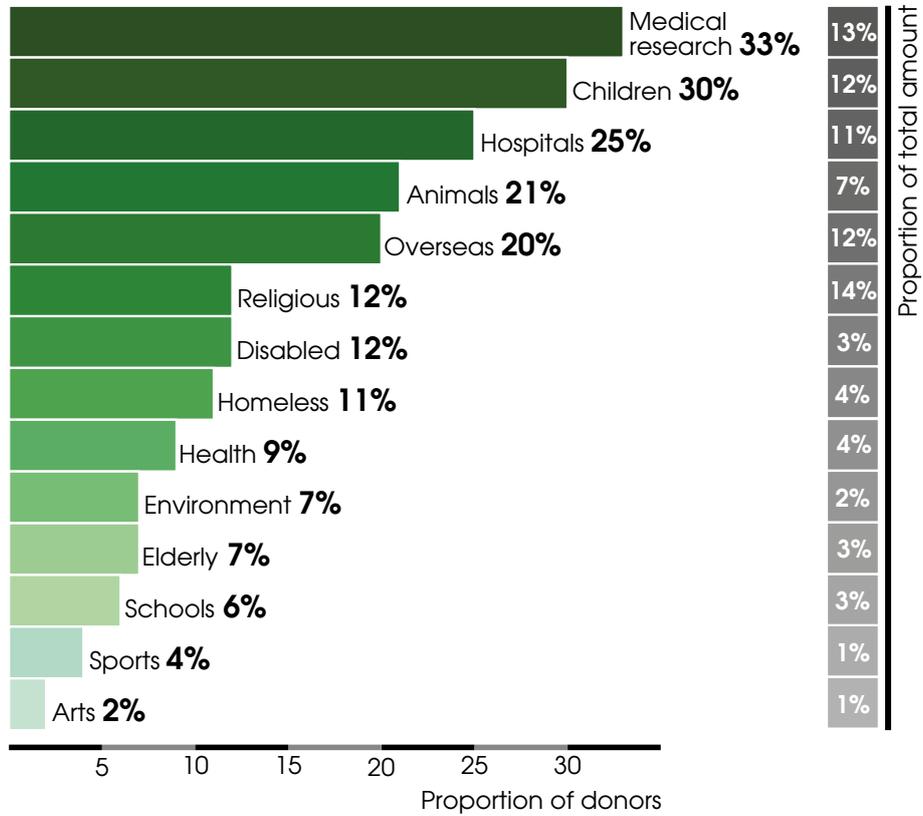
Public charitable giving

The contribution that medical research charities make to health is made possible largely by donations made by the UK public. The World Giving Report 2014 ranks the UK as the top country in the G7 and the 4th country globally with regard to the proportion of people donating money to charitable causes behind Myanmar, Malta and Thailand – with an estimated 39 million people donating to charity each month.⁽³⁷¹⁾ A survey of over 700 donors in the UK found that the strongest motivators for people were personal values, morality and ethics (96%), belief in a specific cause (75%) and faith (71%).⁽³⁷²⁾

In addition to societal values in the UK, and the tax and regulatory environment around philanthropic giving makes a strong contribution to this level of giving, with the UK scoring the maximum 11 out of 11 points in the 'Rules to Give By' Global Philanthropy Legal Environment Index Report. This includes tax-exemption for non-profits, charitable relief for individuals through Gift Aid and exemption from inheritance tax and charitable relief for corporations.⁽³⁷³⁾ This report highlights that whilst generosity cannot be created by government policy, the regulatory regime can encourage charitable giving and maximise the availability of resources to not-for-profit actors to be able to operate more effectively.

With regard to what people choose to give to, health scores extremely highly. Medical research, year on year, is the UK's most popular cause with an estimated 11.2 million people in the UK donating to medical research charities in a typical month. As illustrated in Figure 70, medical research attracts the highest proportion of donors at 33%, as well as a significant proportion of the total donated funds at 13%. Overseas giving also attracts a large proportion of the total amount (12%), with a significant proportion of this spent on health.⁽³⁷⁴⁾

Figure 70: Proportion of donors giving to different causes 2014



Source: Charities Aid Foundation UK Giving Report 2014

The UK foundation Comic Relief plays a critical role in channelling public giving towards improving health globally, raising over £78m from the public during Red Nose Day 2015 and over £1bn in total from the public over the last 30 years. Spending on health internationally is their largest area of spend, and these funds have contributed to helping over 3 million people affected by HIV, 6 million people affected by malaria and vaccinating 2 million children against deadly diseases.⁽³⁷⁵⁾

Conclusions

Contribution of the not-for-profit sector to improving health and shared prosperity across the world

1. **The UK not-for-profit sector contributes to improving health across the world through:**
 - a. An extensive network of NGOs working overseas and delivering essential services that improve health; engaging in capacity building of local civil society; engaging in health advocacy to ensure that national governments and the international community balances economic interests with social justice and the right to health; and carrying out research. UK NGOs also play a key role in responding to humanitarian and health emergencies and tackling major gaps in global health such as the lack of health information in LMICs through facilitating the HIFA campaign. NGOs also play an important role in supporting volunteering by NHS professionals.
 - b. Grant-giving foundations including the Wellcome Trust and CIFF spending significant sums of money on activities that improve health across the world, including research and programming in health and nutrition in LMICs.
 - c. Medical research charities funding research that lead to advancements in the prevention, diagnosis and treatment of major causes of ill health, as well as contributing to essential research on improved service delivery and health systems strengthening.
 - d. A small foundation sector in financial terms relative to the US, though the Association of Charitable Foundations found that the US system is the product of a unique combination of social, political and historic factors and cannot be replicated – for example the absence of an organised welfare state in the way we have one in the UK. Accordingly, this may be viewed not as a weakness, but as an alternative model of smaller donations from a broader range of people.
2. **This activity contributes to health and prosperity abroad but also benefits the UK population through:**
 - a. Medical research charities providing support to patients in the UK and funding research on a broad range of diseases that affect the UK population, from cancer and heart disease to infections and mental health. This research contributes to an improved understanding of how to prevent, diagnose and treat disease, saving lives and improving the quality of life of those with long-term conditions. The £1.3bn spent on medical research by charities also leverages an additional £2-5bn of commercial investment, bringing further health and economic benefits to the UK and building on the UK's global reputation as a centre of medical research and innovation.
 - b. Foundations supporting health research and a broad range of other charitable activities in the UK; and INGOs such as Oxfam using their influence and reputation gained from their work internationally to advocate for policies and engage in programming that contributes to tackling poverty in the UK.
 - c. Generating employment in the UK, with over 820,000 people employed in the whole charity sector in the UK, generating over £12bn in the economy.

The not-for-profit sector's weaknesses and vulnerabilities with regard to its contribution to improving health and shared prosperity across the world

1. **Certain weaknesses were identified that currently limit the contribution that the not-for-profit sector can make, including:**
 - a. Gaps in geographic footprint for the NGO sector, with the highest number of NGOs active in Anglophone sub-Saharan Africa, South Asia and other countries with which the UK has historic links; and sectoral gaps, particularly in mental health.
 - b. Challenges in coordination for the NGO sector, leading to both gaps and duplications in providing health services to populations in host countries. Whilst the UK has successful models of coordination, for example DEC for humanitarian emergencies, the Zambia-UK Health Workforce Alliance for capacity strengthening in Zambia and Action for Global Health UK, this remains a broader challenge for the sector. The lack of consistent data across the sector on which NGOs are working where and on what also limits the ability for coordination, with the IATI database only providing a partial picture.
 - c. A lack of clinical and front-line health expertise within the NGO sector other than the UK branch of MSF. This limits the sectors ability to respond to health emergencies, such as the Ebola outbreak in West Africa.
 - d. A small foundation sector in financial terms relative to the US, though the Association of Charitable Foundations found that the US system is the product of a unique combination of social, political and historic factors and cannot be replicated – for example the absence of an organised welfare state in the way we have one in the UK. Accordingly, this may be viewed not as a weakness, but as an alternative model of smaller donations from a broader range of people.
2. **Additionally, looking ahead there were also threats that were identified to the not-for-profit sector's ability to continue to take a strong role in health globally, including:**
 - a. As larger NGOs grow in size and become more reliant on government and corporate funding for their activities, this may limit their ability to act as an independent voice. This also carries the risk of them becoming more disconnected from populations that they seek to support, noted by some interviewees to be the case with regard to poor representation of 'Southern' voices whilst engaging with high-level policy processes such as the Post-2015 Development Agenda.
 - b. The changing environment in which many NGOs operate, with rising levels of attacks on aid workers, kidnappings and deaths. This erosion of recognition of the neutrality and impartiality of aid workers is creating both risks for NGO staff as well as hindering the provision of aid and health services. NGOs are continuously adapting to protect the lives of their staff whilst still trying to deliver health and essential services, though this is becoming increasingly challenging in some country contexts.

The strengths and potential for growing the not-for-profit sector's contribution to improving health and shared prosperity across the world.

1. **The strengths of the UK's not-for-profit sector that enable it to effectively contribute to improving health across the world include:**
 - a. The size and scale of the sector, with over 6,500 charities reporting activity in improving health abroad; a strong diversity in the approaches taken, groups targeted and focus areas; and globally respected expertise in programming. This is reflected in the UK having three of the top ten NGOs in the world in the Global_Geneva 2015 rankings, and the second largest number of top 500 NGOs in the world. This has led to UK NGOs having significant influence in policy making at the national and global level. The foundation sector is likewise large and includes the Wellcome Trust and CIFF who are global leaders in funding health research and programming, and the medical research charity sector contains some of the world's largest actors in this field.
 - b. Strong expertise across a broad range of areas of health in NGOs, foundations and medical research charities, though less so in mental health. UK NGOs were also noted to have particular expertise in working in fragile and conflict affected states, where a service delivery role remains crucial to protecting the health of local populations. They also have a strong history of advocacy for marginalised and vulnerable groups, ensuring they have access to health services.
 - c. A strong focus on shifting the balance of power towards LMICs, with NGOs such as the HIV/AIDS Alliance focusing on working through in-country partners; and the Wellcome Trust and other foundations developing a reputation for building capacity in LMICs.
 - d. A range of collaborative partnerships, particularly in medical research. The Wellcome Trust has a broad range of partnerships with other research funders and medical research charities work together closely with partners in the NHS, academia and industry to maximise the effectiveness of research funding. UK NGOs have also developed progressive partnerships with corporate actors such as GSK, combining strengths and expertise to tackle health challenges in LMICs and support the core business of the company.
 - e. A strong supportive environment, including the tax and regulatory landscape; government support for the NGO sector through DFID funding and for medical research charities through the Charity Research Support Fund; and a range of membership bodies such as Bond, Action for Global Health UK and the Association of Medical Research Charities.
 - f. A strong culture of public charitable giving, with medical research the most popular cause for public donations. The UK public also donate a significant amount to improving health overseas through direct giving to INGOs active in health, campaigns for humanitarian aid coordinated by DEC and through other routes such as Comic Relief campaigns.

2. **Building on these strengths and looking ahead, there are several opportunities to grow the contribution of this sector to improving health across the world, including:**
- a. Supporting the growing desire in LMICs whose economies are growing to take over the running of their own services and for local NGOs to take over roles traditionally carried out by INGOs. UK NGOs are well placed through their established networks and experience in supporting this shift of power to continue to work in partnership to mobilise civil society at country level and build capacity in local NGOs to engage in advocacy.
 - b. Building on their experience in engaging in policy development in the UK and at a global level to continue to represent the voices of poor and marginalised populations around the world on health challenges that affect them, particularly around the right to health and the UHC agenda where UK NGOs have played a key role.
 - c. Building on the cross-sectoral working seen with mutually beneficial corporate partnerships and working with the state, academic and commercial sectors during the UK response to the Ebola outbreak to engage in more collaborative working across sectors that harnesses the relative strengths of UK actors to tackle health challenges in LMICs.

Conclusions and Recommendations

This report set out to present:

- A mapping of UK actors in each sector and their contribution to improving health globally
- A discussion of how this also benefits the UK and its standing in the world
- The strengths and opportunities for increasing this contribution, and conversely the UK's weaknesses and vulnerabilities in this area and the threats it faces to its current position.

Each of the last four chapters has addressed these points and concluded with a summary of strengths, weaknesses, opportunities and threats in that sector. This chapter draws out the main points from these chapters to present some overall conclusions and recommendations. First, however, it describes briefly some of the big changes underway in the wider environment which will influence the UK's future contribution to health globally.

The global environment

There is a unique alignment globally of public demand for health care, investment, innovation and scientific discovery as well as security concerns globally.

There are many fast-moving developments in health and in the wider environment. Looking first to the wider environment, several major trends are apparent which impact heavily on health. The first is continuing globalisation which, accelerated by information and communication technology, has led to increasing global interdependence and profound changes in how people live their lives. A second and closely related one is the continuing shift in wealth and power from the West to the East and the North to the South. In addition there are many conflicts around the world, more refugees globally than at any time since the Second World War, continuing population growth and climate change.

Within the field of health itself there have been significant changes in the pattern of disease in recent years with a particular growth in non-communicable long term or chronic diseases. At the same time there are major advances underway in science and technology. New biological science and technologies are emerging rapidly, bringing new opportunities and challenging existing practices. The social sciences, too, have advanced and brought new insights into the relationships between health, society and the economy.⁽³⁷⁶⁾ These developments together with the shift in disease patterns from infectious and acute diseases to longer term and chronic conditions have brought new emphasis to health promotion and disease prevention.

This opening up of the world has led to a recognition that the industrialised countries of the West can learn a great deal about health and health care from poorer countries which, without their resources and vested interest, are innovating and developing new ways to promote health and deliver care. Examples like Naryana Heart Hospital and Aravindh Eye health in India which use different approaches, task-shifting and innovative business plans are now well known, but there are many more low key local examples of communities providing care and supporting health improvement. It is clear that both richer and poorer countries have something to learn from each other and that there is enormous scope for sharing ideas and co-development.⁽³⁷⁷⁾

Meanwhile, as countries grow richer their citizens from China and India to Saudi Arabia, Latin America and Africa are demanding that their Governments act to improve health care whilst those individuals that can afford it are buying their own. Governments are responding with large increases in health spending whilst venture capitalists seeking health investments are driving asset prices sky high. Growth in health spending globally is expected to rise by 5.2% annually, with Asia and Australasia expected to see growth of 8.1% a year.⁽²⁾ Meanwhile the World Health Organisation, the World Bank and other leading institutions are encouraging countries to develop universal health coverage for their citizens with the likelihood that it will be a central part of the Post-2015 Development Agenda.

This confluence of citizens' demands, investment, science, technology, innovation and security issues is creating a situation where expertise in health and health systems will be invaluable. Existing shortages of health professionals will be exacerbated - placing enormous extra demand on education and training. This represents an huge opportunity for organisations and countries, like the UK, which have the necessary skills and resources to respond - provided they do so in way that supports local ideas and approaches and doesn't simply replicate existing (mainly European and American) models of health care, staffing and education.

The opportunity

Universal health coverage – creating demand for knowledge and expertise

Growing investment from private and public sources – 5.2% p.a globally, 8.1% in Asia and Australasia

Major advances in biosciences, biotechnology and behavioural sciences – driving improvement

Demand for health workers – requiring massive scale-up of education and training

Growing threats from disease and security concerns – requiring expertise and cooperation

The UK's current strengths and future challenges

The UK has great strengths but some critical challenges. This report describes some aspects of the UK's leading role across its different sectors. It has strong partnerships in all sectors and its research is multi-disciplinary and very broadly based. It has very strong linkages globally through the NHS – which has helped shape many national health systems – through its universities, scientific journals and Royal Colleges which conduct research and provide education and accreditation; and through its leading role in international development with DFID, foundations and the network of British NGOs. External observers note a culture of creativity, high standards of research, patient centeredness and probity.

Competition comes from traditional sources such as the USA – which is strengthening its own global health research capacity and has a highly active, health focussed philanthropic sector – and from fast-developing countries like South Korea where health is a major domestic and international priority. As serious, however, are internal weaknesses: its main relationships are with a limited number of nations in a restricted geography, there is a lack of technical skill in delivering alternative models of health financing, the NHS is facing an uncertain future, more emphasis is needed on health promotion and the prevention of disease, most commercial financing is short-term and current immigration policies are discouraging foreign students and researchers.

Strengths	Challenges and risks
Partnerships, collaboration, networks	Changing world power
Education, research and development	Human resources and commercial funding
The NHS, health systems and influence globally	Uncertainties, alternative models
Commitment to international development	Focus on only a few countries with large regional gaps
Culture, creativity, standards and probity	Competition

The UK's contribution to improving health globally

Turning back to the questions of contribution, the last five chapters have described a very large number of activities which largely speak for themselves. It is difficult to summarise the overall contribution and rather than simply produce a long list we can note three key points:

1. In most areas the UK is second only to the US in terms of measureable levels of activity and there are many very impressive examples from genomics to malaria and the treatment of neglected tropical diseases where the UK has led the way globally
2. The UK's government's leadership on international development has helped improve health in many low and middle income countries and helped maintain the UK as an extremely influential leader in global debate and decision making on health – with the Chief Medical Officer now galvanising global action on antimicrobial resistance
3. The NHS and associated elements of the health system such as NICE and the Royal Colleges together with the research journals, Nature, BMJ and the Lancet have helped the UK maintain a very high profile in health

Finally, as an overarching comment, there is growing evidence to suggest that investing in health (including research) has a positive effect on the economy which is relevant to the UK and to the global economy. Four key pathways have been identified. First, better health improves productivity. People are able to work more effectively and not just as manual workers. Secondly, it increases labour force participation because people stay in the workforce for longer being less likely to retire early. Thirdly, there's evidence that having better expectations of future health means that individuals invest more in their own education and therefore become more productive. Finally, having better expectations of future health, particularly in developing countries, there is evidence that people save more and if they save more, then more money is available for capital investment.⁽³⁷⁸⁾

Vision, goals and strategies

The UK can build on its strengths as an outward and forward looking country, creative, open to new ideas and with great traditions of science, health and education. The report proposes a new vision supported by two goals and four strategies for doing so:

Vision

For the UK to be recognised as a global leader in health using the combined strengths of its academic, government, commercial and not-for-profit sectors to work in partnership with others to improve health globally.

Goals

1. **To lead the way on improving health worldwide through**
 - **Developing global public goods in health** – this builds on the research and education capability and expertise and its partnerships with others in international organisations
 - **Supporting other countries to strengthen their health systems and achieve universal health coverage** – this builds on the work of DFID, NGOS, Healthcare UK; NHS partnership schemes; the global networks of NICE, the Royal Colleges and other health bodies; and the role of universities in educating and training health workers.
 - **Advocating for the right to health and supporting civil society globally** – this builds on the Government's role internationally as well as on the work of UK NGOs
2. **To strengthen the UK's influence globally and develop its institutions, industry and economy through**
 - **Helping the UK strengthen its influence and soft power as the best networked country in the world** – this builds on the many powerful historical links around the world (including the Commonwealth, Europe and the G7); its role in the World Health Organisation and other international bodies and needs to extend further into the fast developing areas of the world
 - **Promoting the UK's healthcare and life sciences industries** – this builds on the current successful approaches including the Life Sciences Strategy; Healthcare UK; The Academic Health Science Networks, 'Cell Therapy Catapult' and other collaborative initiatives; and new ventures including Med-City and the Northern Health Science Alliance.
 - **Developing the UK's position as a global 'health hub'** – this builds on the many strengths across all the sectors identified in this report

Strategies:

1. **Create much greater alignment and synergy between the different sectors concerned with health**
 - This already happens through some of the ways identified above but real barriers remain.
2. **Work on health globally in a spirit of mutual learning and co-development**
 - This recognises both the shifting of power and perspectives in the world and the need for the UK, for all its strengths, to improve and adapt its own services and learn from others.
3. **Create a programme of support for universal health coverage which can be offered to other countries**
 - This builds on existing development policies but makes full use of the enormous expertise in health systems and the education and training of health workers
4. **Adapt the Government's foreign, domestic and economic policy to support these goals**
 - This recognises that health needs to be part of foreign and domestic as well as economic and development policy – and seen as contributing to the UK acting “as a serious force for good as the world continues to change”.⁽³⁾

Recommendations

These recommendations are designed both for Government and for leaders in every sector concerned with health. We recommend that:

1. The Government creates and adopts a new vision and strategic approach to health – building on the existing Health is Global strategy and other policies and which incorporates the goals and strategies identified here
2. The Government, commercial enterprises and the whole health sector actively work together to develop the UK as a global ‘health hub’ – where there is major expertise in every area of health – and develop their links and networks throughout the globe, not only in the UK’s traditional areas of influence, so as to establish the UK as a respected global source of health expertise
3. The Government as well as research institutes and foundations continue their support for the development of capacity and capability in science, research and health in other countries and, in recognition of changing world power and perspectives, link this with overt and clear support for mutual learning and co-development
4. The Government Departments of Health, International Development , Business, Innovation & Skills and Education work with universities, the NHS, commercial enterprises, NGOs and other health bodies to determine how best to support health system strengthening, universal health coverage and health worker education and training globally

5. The NHS, both directly and through Health Education England and the equivalents in the other UK countries, actively supports international volunteering and the education and training of UK healthcare and development workers abroad
6. Government, academia, foundations, the commercial sector and the NHS continue to support the current Life Sciences Strategy, widen its scope and develop its links with Healthcare UK
7. The Research Councils and other funding bodies continue to develop the way they work together and establish some Grand Challenges to promote the UK's role in health and related disciplines in a changing world.
8. The NHS, local authorities and their partners recognise the major role they have in influencing health policy and developments around the world, continue to improve health and care services and develop new and much stronger ways to promote health, prevent disease and develop a health creating society
9. UK NGOs concerned with health and its wider determinants work together to support long term international partnerships, develop civil society and the capability to run services, and advocate for health and access to health care globally
10. The Government reviews immigration policy so as to enable universities, research institutes and other science and health based organisations to recruit talent globally and provide education and training services effectively in health.

Abbreviations

A&E.....	Accident and Emergency
ABHI.....	Association of British Healthcare Industries
ABPI.....	Association of the British Pharmaceutical Industry
AHRC.....	Arts and Humanities Research Council
AHSN.....	Academic Health Science Network
AMI.....	Access to Medicines Index
AMR.....	Antimicrobial resistance
AoRMC.....	Academy of Medical Royal Colleges
APPG.....	All-Party Parliamentary Group
ARL.....	African Research Leader Scheme
ARV.....	Antiretroviral therapy
ATI.....	Aid Transparency Index
BBSRC.....	Biotech and Biological Sciences Research Council
BDA.....	British Dietetic Association
BIA.....	Bioindustry Association
BIS.....	Department for Business, Innovation & Skills
BIVDA.....	British In Vitro Diagnostics Association
BJGP.....	British Journal of General Practice
BJOG.....	British Journal of Obstetrics and Gynaecology
BJPsych.....	British Journal of Psychiatry
BMA.....	British Medical Association
BMJ.....	British Medical Journal
BNF.....	British National Formulary
BNFC.....	British National Formulary for Children
BP.....	British Pharmacopoeia Commission
BRICS.....	Brazil, Russia, India, China and South Africa
CBI.....	Confederation of British Industry
CCHSR.....	Cambridge Centre for Health Sciences Research
CDC.....	United States' Centers for Disease Control and Prevention
CDI.....	Commitment to Development Index
CDSR.....	Cochrane Database of Systematic Reviews
CEFM.....	Child, early and forced marriage
CERF.....	United Nations Central Emergency Response Fund
CHD.....	Coronary Heart Disease
CHW.....	Community Health Worker
CIFF.....	Children's Investment Fund Foundation
CIGMR.....	Centre for Integrated Genomic Medical Research
CLAHRC.....	Collaborations for Leadership in Applied Health Research and Care
CMO.....	Chief Medical Officer
CNTD.....	Centre for Neglected Tropical Diseases
CPME.....	Standing Committee of European Doctors
CPRD.....	Clinical Practice Research Datalink
CQC.....	Care Quality Commission
CRN.....	Clinical Research Network
CSO.....	Chief Scientist Office (Scotland)
CSO.....	Civil society organisation
CSP.....	Chartered Society of Physiotherapy
CSR.....	Corporate Social Responsibility
CTD.....	European Clinical Trials Directive

DECC.....	Department for Energy and Climate Change
Defra.....	Department of the Environment, Food and Rural Affairs
DELNI.....	Department for Employment and Learning Northern Ireland
DFI.....	United Kingdom Development Finance Institution
DFID.....	Department for International Development
DFT.....	Department for Transport
DH.....	Department of Health
DHA.....	Dubai Health Authority
DRC.....	Democratic Republic of the Congo
ENT.....	Ear, nose and throat
FEI.....	Further Education Institutions
FGM.....	Female Genital Mutilation
GDP.....	Gross Domestic Product
GHS.....	Global Health Security
GNI.....	Gross National Income
GP.....	General Practitioner
GPA.....	Grade point average
HEI.....	Higher Education Institutions
HGP.....	Human Genome Project
HIC.....	High income country
HIV.....	Human Immunodeficiency Virus
HPV.....	Human Papilloma Virus
HSS.....	Health systems strengthening
HTA.....	Health Technology Appraisals
ICD.....	International Classification of Diseases
INGO.....	International non-governmental organisation
IP.....	Intellectual property
IPO.....	Initial public offering
IVD.....	In Vitro Diagnostics
LDCs.....	Least Developed Countries
LETB.....	Local Education Training Board
LF.....	Lymphatic filariasis
LLHW.....	Lifelong health and wellbeing
LMIC.....	Low- and middle-income country
MCH.....	Maternal and child health
MDGs.....	Millennium Development Goals
MEEP.....	Methods for Economic Evaluation Project
MERS-CoV.....	Middle East respiratory syndrome coronavirus
MTI.....	Medical Training Initiative
NCDs.....	Non-communicable diseases
NEJM.....	New England Journal of Medicine
NGO.....	Non-governmental organisation
NHS.....	National Health Service
NIBSC.....	National Institute of Biological Standards and Control

NICE.....	National Institute for Health and Care Excellence
NICRN.....	Northern Ireland Clinical Research Network
NIHR.....	National Institute for Health Research
NISCHR.....	National Institute for Social Care and Health Research (Wales)
NMC.....	Nursing and Midwifery Council
NTD.....	Neglected tropical disease
O&G.....	Obstetrics and Gynaecology
OCHA.....	United Nations Office for the Coordination of Humanitarian Affairs
ODA.....	Overseas Development Assistance
ODI.....	Overseas Development Institute
OECD.....	Organisation for Economic Cooperation and Development
OECD-DAC.....	OECD Development Assistance Committee
OSCR.....	Office of the Scottish Charity Regulator
PDP.....	Product Development Partnership
PE.....	Private equity
PHC.....	Primary Health Care
PHE.....	Public Health England
PHFI.....	Public Health Foundation of India
PIM.....	Promising Innovative Medicine
PwC.....	Pricewaterhouse Coopers
QoF.....	Quality and Outcomes Framework
R&D.....	Research and development
RCT.....	Randomised Controlled Trial
RCGP.....	Royal College of General Practitioners
RCEM.....	Royal College of Emergency Medicine
RCM.....	Royal College of Midwives
RCN.....	Royal College of Nursing
RCoA.....	Royal College of Anaesthetists
RCOG.....	Royal College of Obstetricians and Gynaecologists
RCOph.....	Royal College of Ophthalmologists
RCP.....	Royal College of Physicians of London
RCPath.....	Royal College of Pathologists
RCPCH.....	Royal College of Paediatrics and Child Health
RCPE.....	Royal College of Physicians of Edinburgh
RCPI.....	Royal College of Physicians of Ireland
RCPSG.....	Royal College of Physicians and Surgeons of Glasgow
RCPsych.....	Royal College of Psychiatrists
RCR.....	Royal College of Radiologists
RCS.....	Royal College of Surgeons
RCSEd.....	Royal College of Surgeons of Edinburgh
RCSI.....	Royal College of Surgeons of Ireland
RCUK.....	Research Councils United Kingdom
REF.....	Research Excellence Framework
RMEG.....	Regenerative Medicine Expert Group
RPC.....	Research Programme Consortia
SCN.....	United Nations Standing Committee on Nutrition

SCOPE.....	Strengthening Collaboration for Operating Pharmacovigilance in Europe project
SCoR.....	Society of Radiographers
SFC.....	Scottish Funding Council
SGC.....	Structural Genomics Consortium
SME.....	Small and medium-sized enterprise
SSFCC.....	Sub-standard/spurious/falsely labelled/falsified/counterfeit medical products
STAG-AMR.....	Strategic and Technical Advisory Group on Antimicrobial Resistance
STFC.....	Science and Technology Facilities Council
STP.....	Science and technology park
TB.....	Tuberculosis
TDA.....	National Health Service Trust Development Authority
THE.....	Times Higher Education
THET.....	Tropical Health Education Trust
TRC.....	Translational Research Collaboration
TSB.....	Technology Strategy Board
UCL.....	University College London
UEMS.....	European Union of Medical Specialists
UHC.....	Universal health coverage
UKCDS.....	United Kingdom Collaborative on Development Sciences
UKIEMR.....	United Kingdom International Emergency Medical Register
UKIETR.....	United Kingdom International Emergency Trauma Register
UKSPA.....	United Kingdom Science Park Association
UKTI.....	United Kingdom Trade and Investment
UN.....	United Nations
UNAIDS.....	Joint United Nations Programme on HIV/AIDS
UNDP.....	United Nations Development Programme
UNFPA.....	United Nations Population Fund
UNHCR.....	United Nations High Commission for Refugees
UNICEF.....	United Nations Children's Fund
VC.....	Venture capital
VSO.....	Voluntary Service Overseas
WBG.....	World Bank Group
WCPT.....	World Confederation for Physical Therapy
WFP.....	World Food Programme
WHA.....	World Health Assembly
WHO-FIC.....	World Health Organisation Family of International Classifications
WIPO.....	World Intellectual Property Organisation
WMA.....	World Medical Association
WONCA.....	World Organisation of Family Doctors
WTCHG.....	Wellcome Trust Centre for Human Genetics

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