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A Report by the All-Party Parliamentary Group on Global Health  
Researched by Sarah Curran, Helena Legido-Quigley and Julia Spencer

# The UK as a global centre for health and health science

a go-to place for all aspects of health globally



# The UK's contribution to health globally – 2020 update

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The APPG published a report on the UK's contribution to health globally in 2015 which mapped out the UK's health related activity in academia, government, commerce and the not-for-profit sector. This report is a far shorter update which describes what has changed since and collates the perceptions of the UK's role in health from experts based inside and outside of the UK.

It has been researched by two of the researchers of the original report – Sarah Curran and Helena Legido-Quigley, together with another colleague, Julia Spencer. All are from the London School of Hygiene & Tropical Medicine.

The APPG is very grateful to everyone who has contributed and in particular to the following people who have discussed and advised on the overall conclusions, strategy and recommendations: Sir John Bell, Kalipso Chalkidou, Lord Ara Darzi, Sir Jeremy Farrar, Liz Grant, Richard Horton, David Lalloo, Heidi Larson, Sir Robert Lechler, Martin McKee, Seamus O'Neill, Baron Peter Piot, Sir Patrick Vallance, Charlotte Watts and Chris Whitty.

The final contents and recommendations of the report are, however, the sole responsibility of the APPG.

## Contents

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Overview .....	1
Strategy .....	2
Recommendations .....	3
Chapter 1:	
The UK's changing footprint in health .....	5
– Academic Sector .....	8
– The State Sector .....	12
– The Commercial Sector .....	18
– Not-for-profit Sector .....	21
Chapter 2:	
Perceptions of the UK's contribution to health globally .....	24
– Internal perspectives .....	25
– External perspectives .....	31
Concluding remarks .....	37
Acknowledgements .....	38
References .....	39

## Overview

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Our vision is for the UK to become a global centre for health and health science – a go-to place for all aspects of health globally.

The UK is already a leader in health and the related sciences. In this report we argue that the UK should give this role even greater priority and that further planning, collaboration and targeted investment will enable the UK to become a truly global centre for health and health science.

This will bring enormous economic benefits to the UK and strengthen its influence and soft power. It will also maintain the UK's role in promoting high standards in science and business globally and the development of global public goods in health.

We believe that this is a vision which everyone can get behind in the new post-Brexit world.

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The timing is perfect. The health sector is growing fast, science and technology promise new breakthroughs and the UK is well placed to take advantage of them.

Our 2015 report mapped the UK's contribution to health, showing that it has world class universities and research, is a global leader in health policy and international development, has strong life sciences and bio-medical and bio-tech industries, and a vibrant and diverse not-for-profit sector.

This 2020 update identifies many improvements in the last five years with, for example, increased government funding for research, greater foreign investment in UK bio-medicine and life sciences, new regional collaborations and advances in artificial intelligence, genomics and mental health. But there are also new risks in shortages of health and research workers, potential loss of access to and influence over European research funds and partnerships and increased global competition.

Our researchers interviewed 78 health leaders, half each from the UK and abroad, who provided powerful insights. They see the UK as having a very positive role to play and reported enormous respect for its values, scientific and business standards as well as for its institutions and achievements. But they also raised concerns about a possible UK retreat from its global role and about growing nationalism, polarisation and protectionism in the world as a whole.

We argue that decisive action is now needed to seize the opportunities before us, change these perceptions and manage the risks.

We are very grateful to our researchers and to the many people who have been interviewed and contributed. We are particularly grateful to the people listed on the facing page who have provided valuable advice on this strategy and the recommendations.



Dr Daniel Poulter MP  
*Chair*



Lord Nigel Crisp  
*Co-Chair*



Lord Ajay Kakkar  
*Treasurer*

On behalf of the All-Party Parliamentary Group on Global Health.

## Strategy

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The UK needs to act decisively to maintain and strengthen its role as a global leader in health and health science.

We advocate a two part strategy that stresses the importance of the UK maintaining its reputation as a trusted and values-based partner with high standards and at the same time seeks to grasp the opportunity of greater synergy and collaboration between all the UK organisations working in health.

The two parts of the strategy are:

- **Global commitment, values and standards.** The UK re-confirming its commitment to improving health globally, developing global public goods in partnerships with other countries and organisations, and working to the highest standards in science, business and partnerships.

This commitment will need to be demonstrated in practice through support for the Sustainable Development Goals (SDGs) and in particular by:

- Advocating for the right to health for all peoples everywhere and supporting civil society globally – building on the UK's track record in supporting access to health, gender equality, civil society and the rights of minority groups.
  - Addressing health, well-being and the determinants of health as well as health care – based on new and renewed understanding of the links between individual health, the economy, planetary health and the health and well-being of nations.
  - Focusing explicitly on shared development and mutual learning – understanding that the greatest gains will come from working and learning together.
- **A global centre.** The development of the UK as a global centre for health and health science – a go-to place for all aspects of health – which brings together the combined strengths of its academic, government, commercial and not-for-profit sectors to realise synergies and create a shared vision.

The success of this strategy will depend above all on its adding value to organisations and institutions across the whole spectrum of health and health science and in every part of the UK. It will need to be open and inclusive and require mechanisms for:

- Maintaining an overview of UK activity on health globally, identifying gaps and opportunities and convening groups as necessary.
- Influencing Government and working with it to create the environment in which enterprise and innovation in health and health science can thrive.
- Communicating the value of the UK's contribution to health and health science to people working in the area, the UK public and globally and building a sense of shared national purpose.

## Recommendations

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There are enormous opportunities globally in this fast growing sector and the UK has a well established core of institutions and expertise which will allow it to take full advantage of them.

These recommendations are designed to enable the UK both to grasp these opportunities and to manage and mitigate the risks and difficulties it faces.

The recommendations are aimed at every organisation and sector concerned with health and health science. The Government has a fundamentally important part to play but it must not be the only or the controlling player. We believe, however, that how Government addresses the immigration issues and Overseas Development Assistance (ODA) in recommendations 7 and 8 below will be crucial. These two issues, as described later in Section 6, are viewed by many UK and foreign observers as symbolic of the Government's intentions for the future.

1. **Strategy and leadership.** Develop this strategy, identifying what needs to be done and by whom, and provide visible leadership. This can be done in several different ways, but the key criteria are that both the strategy development and the leadership must involve academia, clinicians, National Health Service (NHS) organisations, industry and civil society groups and it should build wherever possible on existing structures rather than create new ones.
2. **International partnerships.** Strengthen and develop further the UK's existing international partnerships, collaborations and networks by:
  - a. Playing a leading role in international organisations such as the World Health Organization (WHO), Global Fund to Fight AIDS, Tuberculosis and Malaria, World Bank and GAVI, the Vaccine Alliance to engage in and influence global policy and plans.
  - b. Collaborating with partners in industrialised countries in research, innovation and other areas in order to keep the UK at the forefront of developments globally.
  - c. Working with fast developing countries to help develop their health systems and improve population health and provide commercial opportunities for UK organisations.
  - d. Supporting low income countries through the full range of UK academic, government, not-for-profit and commercial organisations.
3. **National, regional and local collaborations.** Support the national, regional and local collaborations that have developed in the last five years, recognising the untapped potential for growth and development in particular in Scotland, the Northern Health Sciences Alliance, Wales and the South West of England. The potential benefits from integrating activity across the different sectors are brought out in the recent Academy of Medical Sciences report on integration between the NHS and academia and elsewhere.
4. **Research.** Sustain and develop further the strategic and operational links between research funders and with researchers; build on current initiatives in interdisciplinary research and develop areas of opportunity such as the health workforce, public health and health economics.

5. **Commerce.** Continue support for innovation, science and the economy. This will build on the Life Sciences Strategy and other existing policies and pay particular attention to creating synergy across sectors in promoting and creating an enabling environment for innovation and for affordable solutions.
6. **Workforce policy.** Continue the development of workforce policy and ensure it is based on a good understanding of health issues globally and the needs of the future. This should build on the excellence of the UK's educational institutions and on initiatives for shared learning such as Health Education England's *Earn, Learn and Return* schemes to support the education and training of health workers in the UK and globally.
7. **Immigration.** Introduce immigration policies which enable the recruitment and retention of health workers and scientists from outside the UK (subject to ethical considerations of "brain drain" from low resource countries) and permit travel of international experts to the UK for conferences and meetings.
8. **International development.** Strengthen international development policy – with an increasing focus on shared development and mutual learning – and retain the UK's commitment to spending 0.7% of gross national income (GNI) in ODA.
9. **The NHS.** Recognise that the NHS provides an invaluable foundation for the whole health sector in everything from service delivery and development to education and research. Strengthen the health and care sector in the UK and enable it to develop as a post-industrial health and care system: home and community based, technology enabled and with the focus on health, health creation and well-being – and not just health care – and where the UK can once again lead the world.
10. **Priority areas.** Identify priority areas for UK focus on improving health globally. These are likely to include anti-microbial resistance (AMR) and areas related to health systems strengthening and Universal Health Coverage (UHC), drawing on all the expertise and experience gained in 70 years of the NHS. These areas might include NICE, Public Health England, the use of data in the development of health systems, the Medicines and Healthcare products Regulatory Agency and other aspects of regulation.
11. **Data.** Work with the Health Data Research UK and other partners to develop global governance for the ethical use of data and artificial intelligence (AI) in health. This will involve developing mechanisms to ensure security and privacy in their use and help promote trust and confidence in science and health systems globally.
12. **Communications.** Communicate the plan and progress with implementation to the widest audience in the UK and abroad seeking buy-in and support from all key constituencies.

## 1: The UK's changing footprint in health

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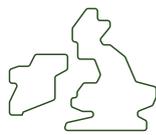
The following section revisits the mapping conducted in the 2015 report. The work presented here is not an exhaustive overview of all the health related activities and institutions across the state, not for profit, academic and commercial sectors. Rather it highlights any major shifts or changes in the past four years that have taken place across the four sectors with regards to their respective areas of work in health and health science. It does not repeat the full mapping of the UK's contribution to health globally. The original document can be accessed at [www.appg-globalhealth.org.uk](http://www.appg-globalhealth.org.uk).

This report uses a broad definition of health to include activities and institutions which have improving health or the provision of health care as primary objectives. Whilst some of the key developments are detailed in four sector sections, the boundaries between the four sectors are not rigid – indeed many overlap reflecting both the interconnectedness of institutions and activities across the sectors.

The research for the report was undertaken through a mixture of desk-based reviews, analysis of primary data and semi-structured interviews with leaders from both the UK and abroad. Findings have been discussed at different stages with experts from each of the four sectors as well as with Parliamentarians and representatives of the 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.

## Academic Sector

UK universities top the global rankings with the **University of Oxford** and **University of Cambridge** coming in 1st and 2nd respectively and with **Imperial College** ranked 8th – the only European institutions to make the top 10 list



Regional R&D hubs include the “**golden triangle**” and **MedCity** in the South East, **GW4** in the South West; the **Northern Health Science Alliance (NHSA)** in the North of England; **Edinburgh’s BioQuarter** and the **Life Science Hub** Wales



The UK is home to some of the highest ranking medical and health journals globally including **The Lancet**, **Nature**, and **BMJ**



The UK’s field-weighted citation has ranked **1st in the G7 every year since 2007**



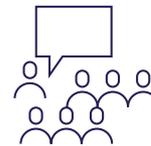
**55% of UK publications** were the result of international collaboration in 2018, higher than the OECD average (31%)

## State Sector



The UK is the World’s **3rd largest donor**, spending **£14.6 billion** in 2018 on ODA. **1** of only 5 countries globally to meet the 0.7% of GNI target

The UK is the **largest funder of Gavi**, and is the 3rd largest public donor of the Global Fund. UK to host Gavi’s third replenishment pledging conference in 2020



For 2016–2021, the UK’s aid budget for research saw a **three-fold increase** with multiple new funding sources and programs including the **£1.6 billion GCRF** and a new co-ordinating body called the SCOR Board

In the past 4 years, **over 100 NHS institutions** and **2,000 NHS staff** have provided more than **95,000 days** of their time to work in health overseas



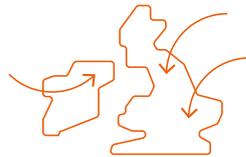
The UK has committed to raising R&D investment to **2.4% of GDP by 2027**

## Commercial Sector

The UK life science sector generates almost **£74 billion** in annual turnover and **employs close to a quarter of a million people**



GSK retains its **#1 position in the world** for improving access to medicines in low-income countries



The UK remains the **top destination** for life sciences inward investment in Europe and ranks **second globally** behind the US

The UK is ranked **4th** in the Global Innovation Index and is **4th** most promising market globally for innovation, disruption and technology



The UK is already home to some of the world's leading **AI and health tech companies**



## Not-for-profit Sector

A vibrant foundation sector including the Wellcome Trust, Cluff, Comic Relief and Leverhulme Trust



The Wellcome Trust is **3rd largest charitable foundation** globally with an approximate spend of **£1 billion per year** on health research in the next 5 years with 20% of that internationally focused

In 2018 UKRI was established to bring together the **7 research councils, Innovate UK and HEFC** into 1 unified body



Medical research charities have invested approximately **£13 billion in research** in the UK since 2008



Medical research is still the top cause to which the UK public donate and cancer remains the top funded area

The UK's vibrant charity and civil society sector is organised into member-based organisations, which include; BOND, Scotland's International Development Alliance, the Wales and South West International Development Network and South Yorkshire International Development Network and the Action for Global Health Network UK (AfGH)



## 2: Academic Sector

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The UK's academic institutions – including its world leading universities, think tanks and academic journals – remain a core strength of the UK and a major draw for both talent and investment into the country. The UK Government's recent commitments to science, innovation and research, both through the Industrial Strategy and unprecedented increased investments for ODA-funded research are indicative of the sector's strength and importance to the UK's economy. The UK's investment in health R&D is internationally leading, investing \$3 billion in government funding in 2017 – around double that of Germany, Japan, Canada and other competitors, and behind only the USA globally.<sup>(1)</sup>

In the Times Higher Education World University Rankings (global university performance rankings that assess universities across teaching, research, citations, industry income and international outlook), UK universities top the international rankings with the University of Oxford and University of Cambridge coming in first and second respectively, and with Imperial College ranked eighth. These are the only institutions in Europe to make the top 10 list.<sup>(2)</sup>

The top global universities for life sciences remain concentrated in the US and the UK; more than 170 of the 751 universities in the rankings for life sciences are in one of these two countries, with both Cambridge and Oxford ranking in the top five globally (second and third respectively after the University of Harvard). For education and research in medicine, the UK is home to four of the top ten universities globally.<sup>(2)</sup>

On research output, despite having less than 1% of the world's population, the UK produced 7% of the world's publications and produces 14% of the most highly cited scientific research papers.<sup>(3)</sup> As noted in the last report, the UK remains home to a large number of journals in health, including three of the oldest, influential and most prestigious scientific journals in the world: The Lancet, the British Medical Journal (BMJ) and Nature.

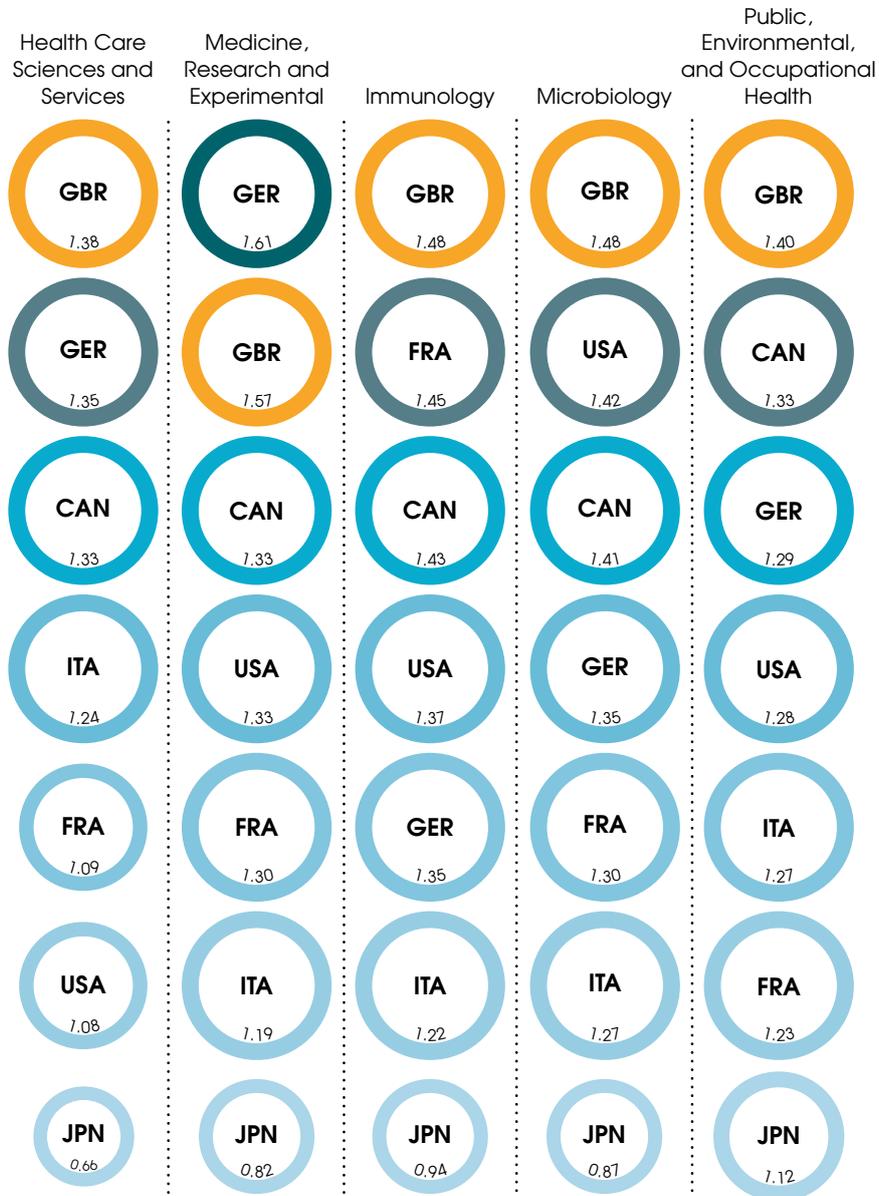
The UK's field-weighted citation impact (FWCI) (measure of how much impact a set of publications have had) has ranked first in the G7 every year since 2007, when the UK initially overtook the US to become the highest ranked comparator. With an overall value of 1.56 in 2018 the UK's FWCI remains over 50% higher than the world average and 30% higher than the European Union (EU) 27 average.<sup>(4)</sup>

In 2018 the UK published 212,876 publications, an 11% increase on the 191,626 produced in 2014.<sup>(4)</sup> This was the third highest number of publications among comparator countries, behind China (606,219) and the US (686,263). Over the past five years, the UK has maintained its 7% share of all global publications despite the significant increase in output from China.

In life sciences, the UK is home to three of the top ten universities in the world for life sciences – Oxford, Cambridge and University College London – and UK research accounts for 12% of all life sciences academic citations, with the UK's share of the top 1% of global life sciences academic citations at 18% (second only to the USA in both cases and ahead of Germany, Canada and France).<sup>(5)</sup>

On the impact of health specific research (the number of times each publication has been referenced in a peer-reviewed journal), Figure 1 below illustrates that the UK is ranked top amongst the G7 countries in the period of 2014-2019 for the quality of its research across the categories of Health Care and Sciences and Services; Immunology; Microbiology; and Public, Environmental and Occupational Health, and second for Medicine Research and Experimental Research. This is an improvement since our previous analysis conducted for the period of 2010-2014. Whilst the US has the largest number of publications across all categories in the G7, these data show that the UK leads the way in terms of quality of health research in these areas.

Figure 1: Research Citation Impact across G7 countries



Furthermore, new data published in 2019 looks at the “most Highly Cited Researchers globally” which identifies top scientific talent and influence by looking at the scientists who produced multiple papers ranking in the top 1% by citations for their field. Across all subjects, the UK ranks second behind the US and ahead of China and Germany.<sup>(6)</sup>

Regional and international collaboration is essential to the academic sector's success. As detailed later in the report, the regional clustering of research institutions in the UK allows for closer collaboration between the commercial sector and research institutes, and examples include MedCity in the South East, GW4 in the South West and the Northern Health Science Alliance in the North of England. Over half (55%) of the UK's publications were the result of international collaboration in 2018, compared with 26% in 1998 and significantly higher than the OECD average of 31%.<sup>(4)</sup>

The ability to attract and retain the best international talent is critical for maintaining the UK's leading position in a globally competitive research and innovation environment. Currently an estimated 28% of UK based academic staff are non-UK nationals.<sup>(7)</sup>

The UK has been a top destination for European scientists. 22% of European Research Council (ERC) grant holders – highly competitive research grants awarded to support outstanding researchers of any EU nationality – currently choose to work in the UK. The UK is also the top destination for Marie Skłodowska-Curie Actions, major mobility research and innovation grants funded by the EU.<sup>(8)</sup>

In the last year, the UK government made further commitments to attract and retain scientific talent. These included the return of post-study work visas in the UK where international students at undergraduate level or above (on the Tier 4 category visa) will be able to work, or look for work, for a period of two years after completing their courses. Key concerns remain in the academic community over the impact of Brexit on the scientific workforce. A 2018 letter to Government, signed by 35 Nobel Laureates and Fields Medallists, including Venki Ramakrishnan, President of the Royal Society and Sir Paul Nurse, the President of the Francis Crick Institute, argued strongly for the closest possible cooperation between the UK and the EU and highlighting the continued need for *“the flow of people and ideas across borders to allow the rapid exchange of ideas, expertise and technology.”*<sup>(9)</sup>

There remain a large number of uncertainties over the impact that Brexit may have on the sector but EU funding currently represents a major source of research funding in the UK. The EU's Research Framework Programmes are widely considered to be the most successful multilateral funding schemes in the world,<sup>(10)</sup> with prestigious individual grants and strong collaborative and industry funding mechanisms. The current Framework Programme, Horizon 2020, has a total budget of €74.8 billion and the UK has been a significant net beneficiary, securing €5.5 billion of the funding to date (13.5% of the total).<sup>(11)</sup> Since 2016, the academic and scientific community in the UK has been very active in calling for continued membership or associations to these programs with public statements issued from the Wellcome Trust, The Royal Society and others.

In the last few years there has been a change in the organisational set-up of the UK's Research Councils with the establishment of the United Kingdom Research and Innovation (UKRI), a new national funding agency investing in science and research with a combined budget of more than £6 billion. The reorganisation of the UK's seven research councils to now sit within UKRI was influenced by the November 2015 *Review of the Research Councils* publication by Sir Paul Nurse.<sup>(12)</sup> The influential document advocated for keeping the UK's major research councils largely unchanged, but with the creation of a single independent agency to oversee them, with a high-profile leader to interact with government and advocate for British led research. Officially established in April 2018, UKRI now works in partnership with UK universities, research organisations, businesses, charities and government with the goal to create the best possible environment for research and innovation to flourish. One of the top strategic priorities for UKRI is developing the plan for the UK Government's objective of increasing investment in Research and Development (R&D) to 2.4% of GDP (from 1.7% in 2016) by 2027.

### Dementia Research

Globally, there are more than 50 million people living with dementia at an enormous social cost and an economic cost of more than US\$1 trillion. This figure is set to rise with continued expected increases in life expectancy.<sup>(13)</sup>

As noted in the last report, the UK used its presidency of the G8 in 2013 to launch the first G8 Dementia Summit. Since then, dementia has remained a priority on the UK's agenda. Funding for dementia research in the UK saw a 93.1% increase from €77.7 million in 2011 to €159 million in 2016.<sup>(13)</sup> In 2015, the Dementias Platform UK<sup>(14)</sup> was launched. The platform is a public-private partnership, bringing together skilled scientists, from both industry and universities, to use state-of-the-art technology in developing new approaches to research as well as access to unprecedented amounts of cohort data to generate insights into aging, diseases and dementia risk. The UK has also seen the launch in 2017 of the UK Dementia Research Institute (UK DRI), following a £290 million investment from the Medical Research Council (MRC), Alzheimer's Society and Alzheimer's Research UK. The UK DRI is a new single national institute, hosted across seven academic centres, bringing together world-leading expertise in biomedical, care and translational dementia research currently made up of over 350 researchers and growing rapidly.<sup>(15)</sup>

### 3: The State Sector

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#### The Industrial Strategy

In a major policy development, in November 2017 the UK Government published the *Industrial Strategy: Building a Britain Fit for the Future*,<sup>(16)</sup> which set out a government-wide strategy for the UK to be “*the most innovative global economy*”. Detailed further in the next section of the report, key policies at the heart of the strategy included the goal of raising total R&D investment to 2.4% of GDP by 2027 and to 3% in the long term. New “Sector Deals” or partnerships between government and industry to increase sector productivity and include large scale investments, include Sector Deals for the UK’s life sciences and AI, both of which make important contributions to the UK’s role in health globally. These are detailed further in chapter 4.

#### ODA

The UK Government currently meets and remains committed to the United Nations (UN) target of spending 0.7% of its GNI as ODA. The UK is the only member of the G7 to do so and is among only seven countries globally to meet or exceed the target. In 2018, the UK provided an estimated £14.6 billion in ODA<sup>(17)</sup> and is ranked as the third largest ODA funder globally<sup>(18)</sup> (down from second position in the last report, after the US and Germany). Health remains a key strategic priority in ODA spend, comprising the second biggest spend area in the UK’s bilateral (country-to-country) ODA. Africa remains the key focus region for the UK’s bilateral ODA, receiving 50.6% of the Department for International Development’s (DFID) regional specific bilateral spend in 2018 followed by Asia at 39%.<sup>(17)</sup> The top five recipient countries of the UK’s ODA in the same year were Pakistan, Ethiopia, Nigeria, Afghanistan and Syria.

The UK continues to be a major funder to the multilateral system. In 2019, the UK pledged a further £1.4 billion to the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund) – a 16% increase on the UK’s last commitment in 2016.<sup>(19)</sup> The UK, a founding member of the Global Fund, is its third largest public donor, with a total contribution of £3.18 billion to date.<sup>(20)</sup> The UK also retains its position as the largest funder of Gavi, representing nearly a quarter of all donor contributions and pledges from 2000-2020.<sup>(21)</sup> It is estimated that the UK’s investment between 2016 and 2020 will vaccinate 76 million children and save 1.4 million lives.<sup>(22)</sup> In 2020, the UK will host Gavi’s third replenishment pledging conference.

Sexual and reproductive health and rights are also high on the UK’s agenda. In 2017, the UK hosted the London Family Planning Summit where DFID announced an increased investment of approximately £225 million a year until 2022, estimated to help save the lives of over 6,000 women each year; provide contraception for nearly 20 million women; help avert six million unintended pregnancies; and prevent the trauma of 75,000 stillbirths and nearly 44,000 new-born deaths.<sup>(22)</sup> In 2018, DFID announced a new pledge of £50 million at the Global Financing Facility (GFF) replenishment event in Oslo to support the GFF’s continued investment in health systems strengthening for reproductive, maternal and neonatal health in 27 countries across Africa and Asia until 2024, building on the UK’s commitment of £30 million announced at the Family Planning Summit in 2017.<sup>(22)</sup>

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In a notable development from the last report, the 2015 government Spending Review catalysed a key shift in ODA disbursements as the UK adopted a new cross-government strategy, resulting in a greater proportion of the aid budget being spent through departments other than DFID. In 2018, DFID's ODA share represented 74.8% of the total UK ODA, down from 89% of the ODA budget in 2013.<sup>(17)</sup> Currently the largest non-DFID departmental shares of ODA are spent through the Department of Business, Energy and Industrial Strategy (BEIS) with 5.8% of ODA and the Foreign and Commonwealth Office (FCO) with 4.4%.

## ODA Funded Research

In a major shift from 2015, the UK has seen a significant increase in ODA funds specifically earmarked for research and development. For 2016-2021, the ODA budget for research saw a three-fold increase from approximately £400 million in 2015 to over £1.2 billion in 2021,<sup>(23)</sup> with multiple new funding sources and programs. A new body, the Strategic Coherence of ODA-funded Research (SCOR) Board was established in 2018. The Board brings together the Chief Scientific Advisors and Directors of the Department of Health and Social Care (DHSC), DFID, BEIS, UK Research and Innovation (UKRI) and the Wellcome Trust, as well as independent members. It supports coherence across all government ODA-funded research programmes and that of the Wellcome Trust, aiming to add value to departmental level governance and avoid fragmentation. Recent health related topics that the SCOR Board has engaged in include safeguarding in international development research, maternal and neonatal health and funding for AMR.

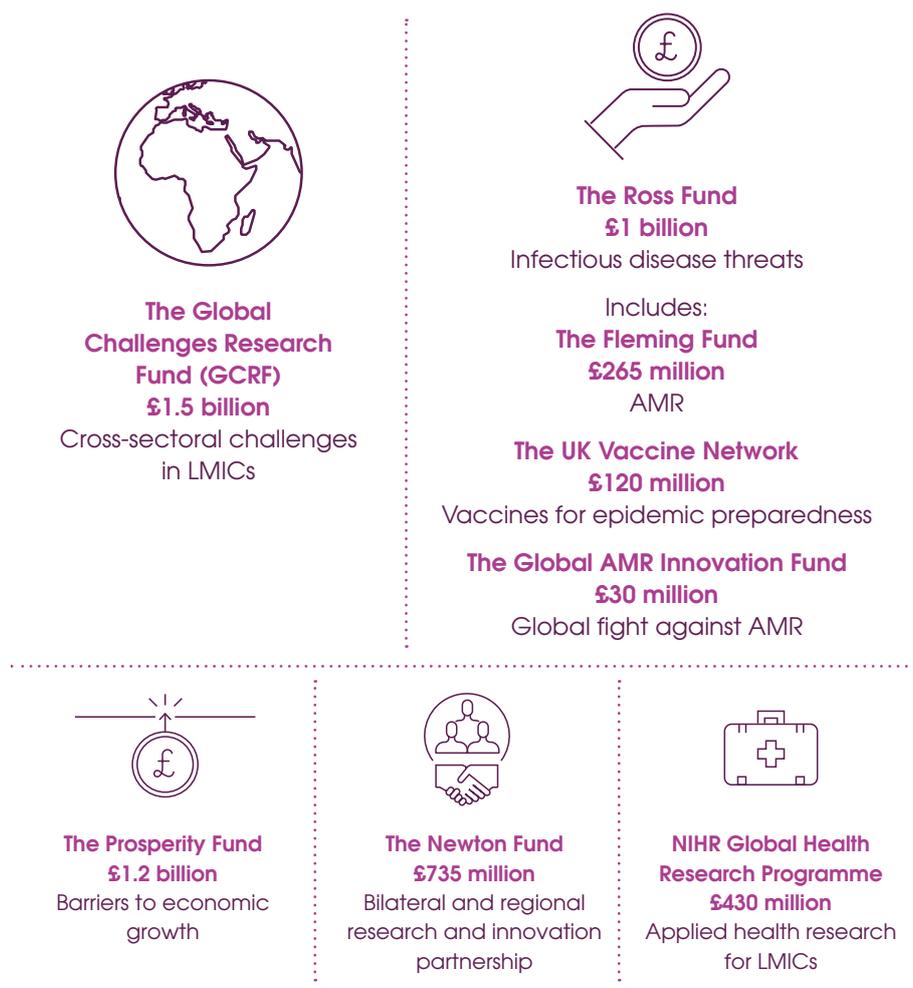
Major new government funding initiatives and funds for multi-disciplinary research have also been established since 2015. These include the £1.5 billion Global Challenges Research Fund (GCRF), funded by BEIS, which seeks to support cutting-edge research to address the cross-sectoral challenges faced by low and middle-income countries (LMICs) (2016-2021).<sup>(24)</sup> The £1 billion Ross Fund aims to develop, test and provide products to combat infectious diseases and includes the £265 million Fleming Fund, which focusses on AMR, a priority area for the UK. Further commitments to AMR include £30 million investment in the Global AMR Innovation Fund. In January 2019, the Government also published its own 20-year vision and 5-year national action plan for how the UK will contribute to containing and controlling AMR by 2040.<sup>(25, 26)</sup>

A £1.2 billion cross government Prosperity Fund was established in 2016 and seeks to contribute to the SDGs by addressing key barriers to economic growth and includes a £79.3 million Better Health Program.<sup>(27)</sup>

Since 2015, there has also been further investments in existing initiatives such as the £735 million Newton Fund (2014-2021) and the £430 million National Institute for Health Research (NIHR) Global Health Research Programme (2016-2021). Taken as a whole, these developments represent an unprecedented volume of research funding from UK ODA.

Figure 2:

## The UK's Global Research and Development Funds



## Health Care Data and AI

The past few years have seen a growing interest in the UK's health data, including ethical and privacy concerns around its management and use. The UK's NHS dataset holds the medical records of an estimated 55 million people and represents a unique repository of patient data from birth to death, across all income levels, ethnicities and regions. In 2019, the company Ernst & Young estimated for the first time the market value to NHS patient data, stating that the dataset could potentially yield up to £9.6 billion per annum.<sup>(28)</sup>

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There has also been a major increase in the uptake of new technologies across health and the digital transformation of the UK's NHS is a stated objective of the UK Government. This has led to the establishment of new bodies, such as NHSX, charged with driving forward the digital transformation of health and social care in the UK, which works alongside the newly created Accelerated Access Collaborative, which focusses on the uptake and adoption of innovation in the NHS. In 2019, the Government announced a further £250 million investment in a new National AI Lab.<sup>(29)</sup> The AI Lab will sit within NHSX and bring together the industry's best academics, specialists and technology companies to work on some of the biggest challenges in health and care, including earlier cancer detection, new dementia treatments and more personalised care.<sup>(5)</sup>

Health Data Research UK was also established in 2017 to apply cutting-edge data science approaches to clinical, biological, and genomic data to enable discoveries that aim to use data at scale to improve population health, drive innovation and further expand the UK industry.

To manage some of the key ethical concerns related to the development of data-driven technology, the Centre for Data Ethics Innovation has been set up. This new independent advisory body is tasked by the UK Government to advise on how to maximise the benefits and minimise the risks with the uptake of such technologies. The Government is bound to consider and respond publicly to their advice.

The UK has been ranked first amongst OECD countries in its readiness to implement AI in public service delivery.<sup>(30)</sup> AI systems for health have already been deployed in health settings across the UK. For example, at Moorefield Eye Hospital in London, an AI system has been making correct referral decisions for over 50 eye diseases with 94% accuracy,<sup>(31)</sup> matching the world's best eye experts. At UCLH in London, AI techniques are currently being used to predict – and subsequently target – patients that are most likely to miss appointments.

### **Genomics: Reaching the 100,000 milestone**

The UK has played a major role in the history and developments of genomics and is seen as having strong academic talent and expertise in the field.<sup>(32)</sup> The UK is home to the UK Biobank – a major national and international health resource open to researchers anywhere in the world, including those funded by academia and industry, who can apply for access to anonymised samples and data. The UK Biobank recruited 500,000 people from across the country for genotyping to be undertaken in all 500,000 participants.<sup>(33)</sup>

In 2018, led by Genomics England in partnership with NHS England, the UK reached its goal of sequencing 100,000 whole genomes from NHS patients. Through the participation of 85,000 participants, 1,500 NHS staff and over 3,000 researchers, the UK is the first nation in the world to apply whole genome sequencing at scale in direct health care, as well as to provide access to high quality de-identified clinical and genomic data for research aimed at improving patient outcomes.<sup>(34)</sup> The NHS is now working toward a goal of sequencing 5 million genomes within five years.

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## The UK's Health care Workforce

The NHS currently employs more than 1.5 million people, putting it in the top five of the world's largest workforces. Staff shortages across the NHS remain a key concern. In 2018, there was an estimated actual shortfall of more than 100,000 staff across NHS trusts with the projected shortfall to reach almost 250,000 by 2030.<sup>(35)</sup> It is estimated that approximately 13.1% of the NHS workforce are not of British nationality<sup>(36)</sup> and of the top 15 countries where NHS staff are most commonly recruited from, seven are LMICs.<sup>(37)</sup>

Nurses and midwives play a critical role not only in delivering health care to millions around the world, but also in transforming health policies, promoting health in communities and supporting patients and families. As an example of the UK's leadership in the nursing sector, in 2016, the WHO designated Cardiff University's School of Healthcare Sciences a WHO Collaborating Centre for Midwifery Education and Practise; the only one in the northern hemisphere dedicated specifically to midwifery. A new global campaign called Nursing Now, which came from the APPG's last 'Triple Impact Report' on nursing, was launched in 2018 to improve health by raising the status and profile of nursing globally. The campaign is a programme of the Burdett Trust for Nursing, an independent charitable trust based in the UK, and now has 550 groups in 112 countries. The UK's health and nursing community plays a highly active role in the campaign. It was instrumental in persuading the WHO to designate 2020 as the Year of the Nurse and the Midwife.

The NHS is increasingly engaging in health work at the global level with both a growing interest from NHS staff for overseas learning opportunities, as well as an increasing demand for NHS expertise and services globally. Organisations such as Health Education England (HEE) and the Tropical Health and Education Trust (THET) facilitate health partnerships to enable the two-way flow of ideas, people, information and innovation across health systems. In the past four years alone, over 100 NHS institutions and 2,000 NHS staff have provided more than 95,000 days of their time to work with colleagues overseas.<sup>(38)</sup> It has been noted, however, that progress in shaping the NHS's engagement with LMICs has been haphazard, expressed through a patchwork of initiatives.<sup>(37)</sup>

### A Culture of Global Citizenship

Global citizenship is viewed by the Scottish Government as a core national value. Scotland was one of the first nations to sign up to the SDGs and Scotland has committed to track its own progress through its acclaimed National Performance Network. Global citizenship is the title of the Scottish Government's 2016 International Development Strategy and the Scottish ODA budget is tracked by SDG goal. In 2017, the Chief Medical Officer of Scotland launched the report "*Global Citizenship in the Scottish Health Service: The value of volunteering*"<sup>(39)</sup> produced by the Royal College of Physicians and Surgeons of Glasgow, which details how NHS Scotland's engagement in global health can be further enhanced. One of the initiatives to emerge from it is the Scottish Global Health Co-ordination Unit – a new portal through which partner countries will be able notify of their need with Scotland being able to match expertise with those countries.

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Global health remains on the agenda across government departments. PHE's work ranges from epidemic preparedness and building public health capacity in Africa to strengthening country compliance with the International Health Regulations, and is due to imminently publish a new PHE Global Health strategy. The UK's Global Health Oversight Group, co-chaired by DFID and DHSC, works to coordinate and engage other government departments across Whitehall around global health.

In 2019, the outgoing Chief Medical Officer for England dedicated her last annual report to the topic of the UK's engagement with health at the global level. The report emphasises the UK's long and proud history as a global leader in health but also warns against complacency. It recommends a series of actions, including the need for the UK Government to publish a set of shared global health objectives and a renewed shared global health strategy by the end of 2019.<sup>(40)</sup>

### **Epidemic Response**

The UK remains at the forefront of new developments in the area of epidemic preparedness and response. Following lessons learned from the 2014-15 West Africa Ebola outbreak, a number of new initiatives and mechanisms have been established. For example, the new UK Public Health Rapid Support Team (UK-PHRST) was launched in 2016 to complement the WHO's work on the Global Health Emergency Workforce. The UK-PHRST is funded by UK aid from the DHSC and is a new partnership between the London School of Hygiene & Tropical Medicine and PHE with the University of Oxford and King's College London as additional academic partners. Through the UK-PHRST, the UK responds rapidly to disease outbreaks in LMICs around the world and conducts operational research into epidemic preparedness. To date, the team has responded to nine global outbreaks, including the most recent Ebola outbreak in the Democratic Republic of the Congo.<sup>(41)</sup>

The Coalition for Epidemic Preparedness (CEPI) is an innovative new global partnership launched in 2017 between public, private, philanthropic, and civil society organisations. With an office in London, CEPI works to fund and coordinate the development of vaccines for both known and unknown infectious diseases where there may previously have been inadequate market incentive to invest. The six priority disease areas for CEPI include: Middle East respiratory syndrome; Lassa fever, Nipah, "Disease X", Rift Valley fever and Chikungunya.<sup>(42)</sup>

## 4: The Commercial Sector

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### The Life Sciences

‘Health life sciences’ specifically refers to the application of biology and technology to health improvement, including biopharmaceuticals, medical technology, genomics, diagnostics and digital health.<sup>(43)</sup> The UK’s life sciences industry remains one of the most important pillars of the UK economy. The Life Sciences sector in the UK is highly productive and export-driven and has generated almost £74 billion in annual turnover, as well as employing close to a quarter of a million people across the sector.<sup>(1)</sup> The UK remains the top destination for life sciences inward investment in Europe and ranks second globally behind the US.<sup>(44)</sup>

In 2017, a wide coalition of industry and charity partners, led by Professor Sir John Bell, published the Life Sciences Industrial Strategy which laid out the case for and the direction of the sector’s future growth, focussing on opportunities in disease detection and genomics; digital technologies and data analytics; and advanced therapeutics. The strategy noted a number of distinct global advantages to exploit in this area, including “*an outstanding research base in world-class universities; significant capabilities in clinical and translational medicine in the NHS; longitudinal datasets within a national health care system; the largest biotech cluster outside the United States; a highly-productive and skilled workforce; and strong capabilities in emerging fields, such as digital health and [AI]*”.<sup>(43)</sup> In January 2020 the Life Sciences Industrial Strategy Update was published, detailing the substantial progress made in making the UK a more attractive place for life sciences companies to succeed and grow. A substantial majority of the objectives in the Life Sciences Industrial Strategy have been met and more are being delivered now.<sup>(5)</sup>

Following the UK’s first Life Science Sectors Deals there was an estimated £500 million of government support for major new research programmes and over £1 billion of new industry investment. One example of the industry investment is, UCB, a leading global pharmaceutical company, which is investing in one of their two major global R&D hubs in the UK, including a purpose-built, state-of-the-art facility to enable cutting-edge R&D, early manufacturing and commercial operations.

All of the top 25 global pharmaceutical companies and the top 30 global medical technology companies have operations in the UK. The UK remains a major exporter of pharmaceutical products. Pharmaceutical sales are up 5.7% annually in 2019, however, continued uncertainty throughout 2019 may disrupt trade.<sup>(45)</sup>

Every two years, the Access to Medicine Index, analyses the top 20 research-based pharmaceutical companies and ranks them according to their efforts to improve access to medicine in LMICs. GlaxoSmithKline, a UK company, has retained its top position among a global list of pharmaceutical companies striving to make their medicines, vaccines and diagnostics more accessible for people in LMICs.<sup>(46)</sup>

In a notable development, the European Medicines Agency (EMA), a decentralised agency of the EU responsible for the scientific evaluation, supervision and safety monitoring of medicine in the EU, relocated from its headquarters in London to Amsterdam in January 2019. The full impact of the relocation on the sector in the UK is yet to be seen but many experts from the sector spoke out publicly on the loss. One direct consequence is the UK will no longer be able to engage as a co-rapporteur for new marketing authorisation applications via the centralised procedure.

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The development of regional clusters to better foster R&D is a focus of the Government's Industrial Strategy and regional clusters have been recognised as making significant contributions to the sector.<sup>(47)</sup> Following the 2014 launch of MedCity, the Cambridge-Oxford-London so called "Golden Triangle" is now firmly established as one of the world's leading concentrations of bio-tech and life science with "co-location" enabling open collaboration between companies, start-ups and universities. As an example of new investment into the area, the FTSE 100 pharmaceutical company Astrogenica is making Cambridge its new headquarters, spending about £500 million building a global strategic R&D site. The Medicines Manufacturing Innovation Centre, scheduled to open in 2020 in Glasgow, will be the first-of-its-kind across the globe and is projected to attract £80 million R&D investment by 2028. A new dedicated Vaccines Manufacturing Innovation Centre, based in Oxford, will accelerate vaccine research in the UK and ensure the UK life sciences industry remains at the forefront of worldwide efforts to tackle life-threatening diseases.<sup>(5)</sup>

Further growth is expected in the Northern Powerhouse region of England where an estimated £1.6 billion in investments is planned over the next five years. This includes Fujifilm Diosynth in Tees Valley, investing £5.7 million this year to develop and manufacture medicines and Rutherford Diagnostics is creating a £15 million diagnostic centre in Liverpool's Knowledge Quarter.

Regional bodies have emerged to promote growth including the Northern Powerhouse Partnership, launched in September 2016 to represent the voice of business and civic leaders across the North of England. Health innovation is one of their strategic priorities. The 'Northern Health Science Alliance' (NHSA) is another newly established initiative in the North of England focused on developing life science and health care capability across the region by linking eight universities and eight NHS Teaching Trusts with the newly formed Academic Health Science Networks. By acting as a single portal, the NHSA aims to bring together academics and clinical researchers, health science innovation and commercialisation and technology transfer activities to promote health and wealth across the region, nationally and internationally.

Launched in 2014, the Life Sciences Hub Wales, based in Cardiff Bay, brings together medical technologies and services companies in the region including GE Healthcare, Johnson & Johnson Innovation, Novartis and MSD. In Scotland the Edinburgh BioQuarter brings together over 25 UK and global life sciences companies with the Royal Infirmary of Edinburgh and academic institutes.

In the South West, the GW4 Alliance brings together the universities of Bath, Bristol, Cardiff and Exeter and champions research and innovation in the region. The Alliance works to identify areas of complementary expertise across the universities and develop research communities at scale able to address major global and industrial challenges.<sup>(48)</sup>

## AI, Health Tech and Innovation

The UK Government has a stated objective of making the UK the best place to start and grow an AI business. The UK is already home to some of the world's leading AI and Health Tech companies including Babylon, Touch Surgery and Benevolent AI. Digital health is now the largest medtech segment, and inward investment to the UK AI sector has increased by 17% over the past year, more than the whole of Europe combined.<sup>(5)</sup>

The UK is the European leader in the sector, with a third of European AI health start-ups founded in the UK. In 2018, UK-based AI companies raised \$1.3 billion, almost as much as the rest of Europe put together.<sup>(49)</sup> The UK is ranked fourth in the Global Innovation Index<sup>(50)</sup> and is also considered the fourth most promising market for innovation, disruption and technology. The UK has invested in new national infrastructure for the life sciences including the Alan Turing Institute for data science and AI and the cross-sector Rosalind Franklin Institute. The Alan Turing Institute is a new national institute for data science and AI, bringing together researchers from five renowned universities Cambridge, Edinburgh, Oxford, University College London and Warwick to generate world class research in AI. At the Rosalind Franklin Institute, physical scientists, engineers and life scientists work together to develop new techniques and instrumentation and apply them to key challenges in health and life sciences.<sup>(5)</sup>

## 5: Not-for-profit Sector

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### The UK's International Non-Governmental Organisations (INGOs)

As noted in the last report, the UK is both home to and a key funder of some of the most prominent INGOs working in health globally, engaged in activities across service delivery, capacity building, advocacy and research across the full spectrum of health. This extends from reproductive, maternal, newborn and child health (e.g. Marie Stopes International and Save the Children) to health of the elderly (e.g. Age International); to neglected tropical diseases (e.g. Sightsavers), WASH (e.g. WaterAid and Oxfam) and mental health (e.g. Basic Needs and Minds for Health). Government funding (which includes both contracts and grants) was the largest source of income for these charities, worth more than £1.2 billion, followed by individual giving from the British public accounting for over £1.17 billion or 31% of the £3.8 billion raised in 2015/16.<sup>(51)</sup>

Many of these INGOs and charities are organised into member-based umbrella organisations, which include: BOND, Scotland's International Development Alliance, the Wales and South West International Development Network and South Yorkshire International Development Network.

The Action for Global Health Network UK (AfGH) is an influential membership network of more than 50 organisations in the UK, including INGOs, charities, advocacy groups, funders and research institutes which work collaboratively under a shared mission of realising the universal right to health.<sup>(52)</sup> The group was originally established in 2006 as part of a European network of global health organisations and seeks to act as a conduit between the UK government and wider global health stakeholders.

In a significant change from the last report, safeguarding against sexual exploitation and abuse has become a high priority for the sector. In 2018, abuses uncovered in the aftermath of the 2010 earthquake in Haiti led further revelations across the sector, including at many of the UK's most prominent organisations such as Oxfam and Save the Children UK.

In response, in October 2018 the UK hosted the *Safeguarding Summit, Putting People First: tackling sexual exploitation and abuse and sexual harassment (SEAH) in the aid sector*. More than 500 organisations took part, including 22 donors. Organisations committed to new global standards on prevention and improved processes covering ethical behaviour, robust recruitment and complaints processes. A recent progress report published by DFID, states that since October 2018 “good progress has been made in tackling SEAH throughout the aid sector. There has been a lot of innovation, including the start of a pilot project with INTERPOL, new tools for NGOs, and a data tracking tool for SEA cases in the UN”<sup>(53)</sup> However, a recent UK Parliament International development Committee report published in October 2019 also “argues that progress has been slow and calls for renewed action from the Government to make safeguarding a central component of all funded aid programmes, and restates the importance of establishing an independent ombudsman to hold the sector to account”<sup>(54)</sup>

## Philanthropy and Foundations

Total grant-making through different kinds of charitable foundations in the UK has been estimated at £6.5 billion.<sup>(55)</sup> The top UK based Foundations with an international health portfolio include the Wellcome Trust, the Children's Investment Fund Foundation, Comic Relief, the Leverhulme Trust and the BBC Children in Need Appeal. In a notable change since the last report, the Leverhulme Trust increased its grant-making substantially including nearly £30 million awarded in 2018 to three new innovative research centres. Each centre will be funded up to £10 million over 10 years to support cross-disciplinary research in sciences, humanities and social sciences.<sup>(56)</sup>

With an explicit mission of improving health for everyone, the Wellcome Trust, remains a highly influential part of the UK's health architecture. Headquartered in London, the Wellcome Trust is now ranked as the third largest charitable foundation in the world, with a £25.9 billion investment portfolio. Their funding supports over 14,000 people in more than 70 countries and its charitable spend in 2018 was £723 million.<sup>(57)</sup> In the next five years, the Wellcome Trust aims to spend up to £5 billion in research funding across science, population health, medical innovation, the humanities and social sciences and public engagement. It is estimated that about 20% of that funding will be spent internationally.

Mental health has recently become an area of increasing interest for the Wellcome Trust and in January 2019 they announced £200 million of new funding to “bring researchers together to improve understanding and treatments for depression and anxiety”. This coincides with notable increased activities across other sectors in the area of mental health in the UK.<sup>(58)</sup> For example, in 2018, the UK established and hosted the first ever Global Ministerial Mental Health Summit which brought together policy makers, politicians, experts and civil society to drive forward political action on mental health. The Summit also coincided with the launch of a landmark Lancet Commission on Global Mental Health and Sustainable Development.

During the UK-EU Brexit negotiations, in 2018 the Wellcome Trust announced that it was opening an office in Berlin, Germany to focus on global health.<sup>(59)</sup> Furthermore, in January 2019, Wellcome announced a key change to their policy on transferring grants, allowing researchers for the first time to move their Wellcome grants to another country or organisation over the course of their research.<sup>(60)</sup>

## Medical Research Charities

Medical research is still the most popular charitable cause in the UK and medical research charities comprise a vital component of the UK's health architecture.

It is estimated that medical research charities have invested approximately £13 billion in research in the UK since 2008.<sup>(61)</sup> In 2015/16, the Association of Medical Research Charities (AMRC) charities contributed 45% of the total non-industry spend on R&D, with the Medical Research Council and NIHR contributing 26% and 29% respectively. As in the last report, medical research is still the top cause to which the UK public donate and cancer remains the top funded area in AMRC sponsored research. At least eight million people in the UK donated to medical research charities in 2017.<sup>(61)</sup>

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Many of the UK's most notable medical research charities have an international portfolio. Cancer Research UK for example funds research in 39 countries across six continents, investing an average of \$500 million per year. It is the world's largest independent funder of cancer research.<sup>(62)</sup>

### **Palliative Care: A Global Movement**

In its global ranking of palliative care across the world, the UK is recognised by the Economist Intelligence Unit as having the highest standard of death globally.<sup>(63)</sup> The UK also has the highest level of integration of palliative care into a health care system. Hospice care originated from the UK in 1967 and the UK is now home to a vibrant movement of academia, local hospices, INGOs, philanthropic institutions and passionate individuals working in different contexts globally to support improved access to palliative care.<sup>(64)</sup> Leading UK organisations and movements with an international focus include: the Centre for Global Health Palliative Care; Cicely Saunders Institute, Kings College London; Palliative Care Voices; Worldwide Hospice Palliative Care Alliance; and the International Children's Palliative Care Network. As noted by the innovation foundation, Nesta in 2016, "*a worldwide movement has grown out of the hospice care movement in the UK and is radically changing the approach to death and dying*".<sup>(65)</sup>

## 6: Internal and External Perspectives on the UK's Contribution to Health Globally

To complement findings from the mapping of major shifts or changes across the four sectors, the following sections explore experts' perceptions of the UK's role in improving health globally in relation to its key strengths, emerging opportunities, as well as challenges and risks to the UK's position and global standing. Between December 2018 and December 2019, 78 expert interviews were conducted with individuals working in health and/or the life sciences, across the four sectors both inside and outside the UK. We defined experts as representatives from organisations that hold a degree of influence over, that collaborate with, or that are impacted by the UK's work in health and health sciences globally. We invited senior representatives working on health from each organisation to participate in the interviews, as well as interviewing specific contacts or teams that were nominated to speak on behalf of their organisations or departments. Interviewees were based across Africa, Australia, Asia, Europe, North America and South America, and efforts were made to identify representatives across the four sectors, including dissenting voices. Interview data were then qualitatively assessed to draw out the key themes from the discussions. The high-level findings from the experts representing organisations based in the UK ("internal experts") are shown first, followed by those whose institutions are based outside of the UK ("external experts").

It should be noted that these interviews were all undertaken during 2019 when no final decision about Brexit had been taken. This is reflected in some of the responses from both UK and foreign experts.

Table 1: Summary of Internal and External Participants

Summary of key informants	No. of informants
Internal experts	39
External experts	39
Total	78
Sector	No. of informants
Academic	22
State	20
Not-for-profit	16
Commercial	9
International organisation	11
Region	No. of informants
UK	39
Europe	14
Africa	5
Asia (+Australia)	10
North America	7
South America	3
Gender	No. of informants
Men	42
Women	36

## 6.1 Internal Perspectives on the UK's Contribution to Health Globally

### Strengths

The UK was perceived to be a global leader in health by most internal respondents, with a range of strengths identified across the four sectors that enable it to contribute effectively to improving health worldwide. Internal experts emphasised the UK's significant technical expertise, high professional standards, health science industries, patient-linked data information systems, world-class training and education, strong linkages and partnerships globally, and good governance and regulation as key aspects of its leading role.

Almost all experts singled out the UK's commitment to spend 0.7% of GNI in ODA as a major contributor to the UK's impact and standing internationally. Many also identified the UK's prioritisation of health in its national and foreign policies, its evidence-based and value-driven work and its reputation for being a balanced voice in global debates as core components of its soft power and influence. The most cited example of strong UK leadership and health diplomacy was in the area of AMR, where the UK was seen to be driving action and prioritisation at the national and global level. Mental health and dementia were other key areas where the UK was perceived to be leading the global agenda.

“...I think AMR (is) a shining example of where the UK is having a massive impact... and I mean, a lot of the credit needs to be laid at the leadership from Sally Davies... it was a Prime Ministerial commitment from David Cameron to do something on AMR, and he commissioned Jim O’Neill to do the study, which is globally recognised, and global ramifications for changing policy there. The fact that (the UK) has chosen to champion AMR at the G7, the G20, has been monumental for moving the debate on AMR forward” (I55-I56)

Most participants viewed the UK's academic sector as a core national asset at the forefront of research, education and training in health globally. Experts noted a number of factors driving this success including a culture of collaborative working and international partnerships, an excellent track record in applied research and expertise in and across a number of disciplines. Some informants also identified the UK's medical and science journals, such as *The Lancet* and the *BMJ*, as world-leading, commenting on their international influence, credibility and position in global rankings.

A supportive funding environment for health research in the UK was seen as a critical ingredient for success. In particular, new government funding streams such as the GCRF were viewed as unprecedented additions to the UK's health landscape, supporting increased interdisciplinary collaboration and innovation in traditionally neglected areas of research. However, some experts also raised concerns about the risk of increased fragmentation and inefficiency with many of the funds being managed in government departments outside of DFID.

The Wellcome Trust, under the leadership of Jeremy Farrar, was recognised by several experts as playing an integral role in the UK and global health architecture in both funding research and driving thought leadership and agenda setting globally.

A range of strong and reputable institutions working across the four sectors was also identified by experts as central to the UK's global contribution. The NHS and its linked institutions were seen by many as the foundation for the UK's expertise in UHC and health systems strengthening, and indeed as a key model that can be leveraged for knowledge exchange both nationally and internationally. However, others disagreed and commented on the UK's perceived overreliance on the NHS model in its health systems strengthening activities overseas, citing an under-appreciation for alternative approaches to delivering and funding health care, for example with regard to the commercial sector. DFID was viewed by many as "*one of the biggest and most important voices in global health*" (143-145), punching above its weight in terms of its global contribution to health, particularly through its engagement in multilateral forums and reputation for good governance and action against corruption. While acknowledging DFID's strong brand and contributions internationally, some also identified perceived gaps in its technical expertise. NICE was also perceived as a world leading institution and as a potential model for countries in health technology assessment (HTA), recognising that there is no one-size-fits-all approach for different contexts. The UK's Academy of Medical Royal Colleges were valued as an important source of training, academic standards and approaches to competency based training.

Some experts also commented on the UK's vibrant pharmaceutical industry relative to its size and identified a number of features that made the UK attractive for the life sciences industries. These included: a very strong science base; relative stability in the country; the UK Biobank; a strong start-up ecosystem; national prioritisation of life sciences and innovation; R&D tax incentives; and a full-pipeline of life science companies from start-ups to large pharmaceutical companies. The UK Biobank in particular was seen by a few respondents as at the apex of the data revolution for health and health science, representing a world leading resource. However, some informants also identified important gaps in the translational space in the UK.

“ The Government have clearly put life science front and centre in the life science industrial strategy and the NHS is a really interesting opportunity to be a test bed for innovations of work that can be scaled up into the global picture ” (143-145)

Informants perceived the UK to benefit greatly from being home to world-leading health experts, who help position the UK globally in terms of thought leadership and networking in global health.

Key areas where participants viewed the UK as making important contributions and where the UK has led included AMR, UHC, mental health, infectious diseases, dementia and health systems strengthening. Other areas of expertise identified included access to medicines, AI, big data, genomics, nursing, surgery, family planning, palliative care, humanitarian response, integrated care, infectious disease modelling and patient centred health outcomes.

In the area of epidemic response, the recently established UK-PHRST was perceived by several experts as an innovative addition to the UK's health landscape, greatly strengthening its leadership position in supporting capacity building in epidemic preparedness and the UK's outbreak response efforts. Several respondents also commented on the UK's strengthened capacity to deploy technical experts to support countries and communities during health crises after the 2014-2015 West African Ebola epidemic.

## Weaknesses

While the UK has great strengths, experts also commented on a range of internal weaknesses and vulnerabilities with regard to its contribution to improving health globally. A recurring theme across the interviews was the perception that the UK as a whole is not yet realising its potential as a global leader in health. Building on a strong foundation for success, the UK was viewed by many as missing important opportunities across the sectors to leverage its technical expertise for global impact and influence, particularly in the area of UHC, health systems strengthening and primary health care. For example, many commented on the UK's perceived failure to effectively utilise its wealth of experience from the NHS model of care to support other countries as they move toward UHC, as well as to play a bigger role in multilateral forums as an advocate for UHC. However, some advised against the UK taking a more active leadership role on UHC globally and rather supporting other countries such as Japan lead the agenda.

“...the NHS is the largest (UHC) system in history...and we train the best value for money health professionals in the world...we're a country mile ahead of any of our western competitors...we simply were hiding this light under a bushel and we weren't utilising this in a co-development sense to maximise both the NHS' impact on global development, but also to utilise those skills to improve the health care that we could deliver to UK citizens” (112)

Most participants perceived the UK's immigration and visa policies to be restrictive, and to undermine its capacity to cultivate international partnerships and research collaborations, to host health events of global relevance, to attract international students and professionals and to leverage its key strength in health worker exchange programmes. Indeed, many experts warned that the UK's global leadership role in health is largely dependent on its capacity to attract and retain the best and brightest international talent. Amidst a perceived global wave of growing nationalism, isolationism and protectionism, the UK's immigration and visa policies were seen by some as symbolic of the UK's retreat from global cooperation and collaboration.

Concern was also raised by several participants that the UK's health architecture is becoming increasingly fragmented with poor coordination at the national level, which was perceived by many to threaten the collective work being carried out across the four sectors, and across Government in particular. However, some internal experts were hopeful that greater coherence across research funding and policy would be possible with new initiatives such as the SCOR Board and UKRI. Some also argued that the UK's way of doing development has been top-down rather than collaborative, which was perceived to hinder sustainability, set inappropriate priorities and stifle progress on innovation due to a lack of appreciation for lessons learned from development partners.

“But today the very fragmented nature of the British aid which includes all these prosperity funds and all these competitive processes and a very large chunk of UK aid goes via non DFID sources...I am thinking this has become very supply driven, where it's been about what the UK does and therefore what it can sell. As oppose to what other countries need and of the UK having the expertise or relevance in that particular area. So by and large I think the UK's footprint on health has gone down and (with) the style and scope of its assistance... the UK would be the last country I would go to if I wanted to actually receive any impartial assistance” (117)

Some participants suggested that the UK has not yet been able to mobilise the effective public-private relationships that will be necessary to deliver on the SDGs. In academia in particular, it was argued by some that innovation is hampered by a negative perception of collaborating with commercial sector partners. However, others identified the UK as particularly open to cross-sector collaboration.

More broadly, a few respondents also recognised attention to issues around bullying, abuse of power and workplace harassment, including sexual harassment in scientific and health institutions. A gender imbalance at the highest levels of leadership in health and health science was also raised as an important issue facing the UK and other countries, with the UK perceived as not yet realizing its potential for driving and advocating for change at the national and global level in this regard.

## Risks

In addition to a number of challenges to be met, participants identified several factors which they perceived to threaten the UK's strong role in health globally. At the time of interviewing, Brexit and its potential implications were a recurring theme, however wider concerns linked to national and geopolitical shifts were also raised.

Several respondents perceived the UK to be at risk of relegating its leadership role in health globally. Many commented on a perceived retreat of UK Government from global cooperation and multilateral forums, noting that it appeared the UK's influence and soft power had diminished in recent years. Within this context, some experts warned of growing competition from China, Japan, India, Germany and France, while others encouraged the UK to work in collaboration rather than competition with other countries rising in global health leadership and influence.

“ Britain's voice on the global stage is massively diminished. You see that at WHO, you see it at the United Nations, you see it in Brussels, you see it in capitals around the world. And I cannot overstate the negative impact it's having on Britain's voice in global health ” (I62)

At the time of interviewing, many participants feared that uncertainty surrounding Brexit and other domestic politics could diminish the UK's reputation internationally, as the UK is at risk of being perceived to be more inward-looking. This was viewed as potentially damaging to international partnerships, research collaborations and to the recruitment of international students and professionals. Moreover, this uncertainty was seen to risk weakening the UK's strong environment for the life sciences industries and investment. Within this context, many pointed to the EMA's relocation from the UK to the Netherlands as symbolic of this shift.

Threats to financing the UK's work in health and health sciences were also identified by most experts. Chief among concerns for most were perceived risks to the UK's commitment to 0.7% of GNI for ODA. Some feared that the 0.7% commitment could be reversed, while others worried that the overall quantity of ODA may diminish due to potential shocks to the UK economy linked to the uncertainties surrounding or potential impacts of Brexit. Some experts also raised concern over what is defined as ODA relevant spending. Others commented on perceived weaknesses in UK donor planning for countries transitioning from low to middle-income status in order to sustain important health and development gains made. Participants agreed that public support and engagement is critical for the UK's continued success and warned that negative perceptions of ODA could risk undermining the UK's commitment to funding health work internationally. Some participants pointed to concerns around safeguarding and accountability and the threat of the "Daily Mail effect", which can be leveraged to "...say that all foreign aid is awful, and we should bring money back to the UK" (138). Finally, for the academic sector, experts were highly concerned that the UK might lose access to key European research funding, which currently represents a major source of funding in the UK.

“ There were some threats ...with our precipitous withdrawal from the middle income or the graduating countries, so I think the rapid withdrawal from South Africa, the rapid withdrawal from India, you know, potentially ... well could have been handled better. And clearly they were done for domestic political reasons, a load of money going to countries that have space programmes, etc. But, you know, it was just done too quickly without necessarily making the most effective use of the strong relationships that we had ” (148)

In addition to major challenges noted above in relation to the UK's immigration and visa policies, the extent to which Brexit may limit the movement of health professionals and students was viewed to potentially jeopardise the UK's ability to recruit and retain expertise in health and to potentially contribute to a critical shortage of skilled health workers in the UK.

## Opportunities

While facing threats to its current strong position, participants also noted opportunities for the UK to build on its strengths and increase its contribution to health and health science. Amidst important geopolitical shifts at the national and global level, most experts perceived the UK to be at a critical juncture, which they viewed as offering an important opportunity to rethink current approaches and to establish a new strategic vision for the UK's future role in improving health globally.

At the time of interview, many informants suggested that Brexit offers an important opportunity for the UK to invest more energy and extra weight into strengthening its existing and generating new partnerships across the globe, beyond its traditional partners, including improving collaborations within the UK. International partnerships were also seen as valuable assets for influence and soft power as the UK plans to leave the EU. Many experts also commented on an important political window for the UK to leverage its technical expertise to strengthen its contribution to multilateralism. For example, many viewed the new global emphasis and prioritisation of UHC in the SDGs as an historic opportunity for the UK to share its expertise and experience with the NHS model with the rest of the world, while also learning lessons from other contexts to improve systems in the UK.

“ At a time when the rest of the world is really bewildered by what’s going on here politically...I think what’s key there, is to build coalitions. A risk would be to try to do it alone, go alone. So, building coalitions not just with like-minded, high income countries, but particularly with low- and middle-income countries ” (I42)

One informant also raised an important opportunity for the UK to capitalise on its internationally renowned creative industries and talent to further engage with the UK public on its work to improve population health outcomes and public support for the UK’s work in health internationally. Other experts pointed to the opportunities for improving health and health science with more effective use and analysis of NHS data, while others expressed caution about the ethics and privacy concerns around its use.

“ NHS data in the UK. It’s a huge, huge opportunity that we’re sitting on, that we’re quite likely not to take advantage of because of historic failures of this in the NHS space, and because of public perception on what happens to data, but we’re sitting on a goldmine, and a goldmine which is both a financial goldmine and a health goldmine ” (I13)

Finally, many experts were optimistic about recent efforts targeted in the UK at building a supportive environment for innovation in health and health science. This was seen as a critical opportunity by many for the UK to build on existing strengths in the areas of health technology assessment, digital health and AI. Several participants saw an opportunity for the UK to lead globally on methodological research for evaluating health technologies and supporting their implementation across the globe.

## 6.2 External Perspectives on the UK's Contribution to Health Globally

### Strengths

Overall, most external participants considered the UK a leader in health globally, thanks to its expertise in multiple areas and research topics, its strong institutions and its unique ways of working. A key strength reported by interviewees was the distinctive way in which the UK understands and promotes health and its determinants given its history and long-established institutions. External participants conveyed that UK organisations across the four sectors have played a central role in setting the agenda, framing and generating priority for global health issues and bringing research-driven insights and evidence into high-level political discussions. The UK's strong leadership role in multilateral institutions such as the WHO and the Global Fund was also highlighted.

“ I think one of UK's strengths is its historical memory, by that I mean the way that the UK sees health given its long trajectory of established institutions and its different angle, and a different perspective on how to address health problems ” (173)

Several interviewees drew attention to the NHS being a particularly strong health care system. While acknowledging its challenges, interviewees commended the NHS for its solid delivery system together with its public health perspective. Within the NHS, the nursing profession was praised for its leadership and pioneering work that has influenced practice worldwide. For example, participants mentioned the impact that the Nursing Now global campaign is having in raising the profile and status of nursing worldwide and in ensuring that nurses and midwives have a more prominent voice in health policy making and in leadership positions.

External participants emphasized the UK Government's continuous efforts to position itself at the forefront of leadership in every area of health and influence health agendas of countries and other global health actors. One example provided by experts was the UK's G8 initiative on dementia, which catalyzed a number of follow-up initiatives on dementia in different G7 countries. The Government's continued commitment to spend 0.7% of GNI on ODA was underscored as a strength, suggesting that it allowed for the expansion of global health commitments during an otherwise turbulent period. Funding for research and specific new funding streams, such as the Fleming Fund, the Ross Fund and the GCRF were also mentioned by several interviewees.

“ I think having the 0.7% commitment gives the UK huge advantages in terms of a legislated policy, that framework that has survived in this most recent very disruptive period. From our standpoint, the period of remarkable expansion of global health commitments, of financing, of the expansion of the political agenda, the creation of the major institutions, and in the last 15+ years, it's been very, very much reliant on two stalwart countries in particular, the UK, and the United States ” (109)

DFID, the Wellcome Trust, and the MRC were considered by experts to be at the forefront of global health capacity building, facilitating education initiatives and scientific leadership in LMICs. Among the actors identified by participants, DFID was most frequently mentioned as playing a key role in advancing health globally.

Areas cited included DFID's respect for its national health priorities within countries, its contribution to multilateral organisations, its approach to managing transitions and exit in partner countries and its holistic and partnership approach to development. The Wellcome Trust was the second most mentioned institution. Experts noted that Wellcome had made a major shift in recent years from just sponsoring or financing projects towards implementation, evaluation and use of evidence in policy making. Interviewees specifically highlighted Wellcome's work on AMR, genomics and mental health. The MRC was greatly valued by external observers for its very unique contribution to developing centres for excellence in Africa, for example in The Gambia and Uganda, and for the research conducted in clinical trials and implementation science.

NICE was also identified by participants as an influential institution, reported to have inspired the establishment of HTA in Thailand and on guiding governments on how to effectively use their health care budget to maximise population health outcomes. PHE was also praised for its work in public health campaigns, particularly around tobacco, alcohol, salt and sugar. Some participants in Africa, Asia and South America mentioned the important contribution of the UK's INGO sector to health globally, with Oxfam and Save the Children being mentioned most often.

UK academic institutions were perceived to be among the top in the world in conducting research, providing training and having some of the best international talent. UK Medical Schools were commended for their high quality education and their ability to evolve training into a more integrated system approach by looking at the person as a whole. The UK was seen as providing high-quality higher education opportunities for researchers globally. As a result, many informants argued that international graduates from British institutions hold influence in shaping national policies and political agendas upon return to their home country and ultimately benefit the UK as these networks enable future collaborations.

“ I think the UK has a very strong role in global health through The London School, Liverpool, Edinburgh. I mean, academically I think the UK is at the top, along with the US (...). In terms of the public sector, really probably DFID, and the UK's role in supporting the global funds. Obviously, in terms of states, I think the UK is probably the second after the US in terms of development assistance for health. (...) You have a very strong Department of Health, Public Health England, obviously the CMO's office. I think the previous CMO did a fantastic job, was really good at bringing global attention to AMR particularly, but also around global health security issues. In terms of civil society I think, of course, the UK is home to a number of NGOs as well, there's the Save the Children, the Oxfam... ” (178)

External participants were asked to identify specific areas of work where they perceived UK leadership to be particularly strong. Most participants reported infectious diseases as the main area of research expertise. Several participants highlighted the UK's indisputable leadership on AMR globally in research, funding, agenda setting and demanding action. Other areas of UK leadership that were highlighted included an overall expertise in health systems strengthening, health promotion and action on the social determinants of health and health inequalities. Additional areas that were mentioned included epidemics (e.g. Ebola), neglected diseases, mental health, dementia, patient safety and genomics. Finally, expertise in methodological areas such as HTA, cohort data analysis and evaluation was emphasised.

Other participants mentioned the UK's unique approach to addressing health issues, with a very strong awareness of the local realities both within the UK but also internationally. In terms of its approach to health globally, it was highlighted that the UK's representatives to international organisations, such as the Global Fund, and those who attend collaborative international meetings, focus much more on the issues of health system strengthening, reinforcing the public sector and country ownership, than other countries, such as the US and Japan. Furthermore, UK institutions working in health globally, most notably DFID, were perceived to be a lot more open and collegial than other institutions, such as the Bill & Melinda Gates Foundation or USAID, and some of the European agencies, with the exception of Sweden. Finally, it was emphasized that the UK has strong, individual champions who play key leadership roles in and have actively shaped the global health agenda.

### Weaknesses

Just as important as these strengths, however, are the weaknesses identified by participants in relation to the UK's contribution to health globally. Perceived weaknesses related to the commercial gains of ODA, short-termism in development priority setting and donor driven agendas. Some participants also emphasized that activities conducted by the UK to help other countries develop their health systems had an income-generating component, which was negatively perceived by external observers. Some interviewees highlighted the potential damage of having a short-term approach guiding the aid agenda towards security, support of business and foreign policy objectives rather than a long-term approach focusing on topics such as poverty alleviation. Some participants emphasised the need for the UK to move away from donor driven agendas and instead focus on the health priorities of each recipient country.

“ I think donor driven agendas generally have no place now in the modern world... I mean I'm not saying that the donors should not exercise their own judgements, but you cannot foist an agenda. And some of the preference that the donors have had for vertical programmes has already proved to be counterproductive ” (I02)

Some participants reported that the UK was less engaged in health diplomacy recently and that other countries were starting to have a more dominant presence, for example France, especially at ministerial level. It was also mentioned that at the 2019 World Health Assembly, the UK did not have a strong voice (in comparison to Germany and Norway), was not actively participating in international consultations and that recently UK representatives sent to these meetings were more junior and inexperienced. Participants from South America, whilst acknowledging UK strengths in health globally, noted that the UK's influence in South America is weak and limited, with little exchange of students and academics. This contrasts with the strong US presence and closer relationship with Spain.

Participants working closely with the life sciences industry mentioned that the UK does not have a very good venture capital landscape, or at least not compared to the US, in terms of funding technology, IT and bio-tech companies. Participants highlighted that it is a Europe-wide problem, but it is particularly true in the UK. Furthermore, participants from the US, Norway and Singapore mentioned that the UK lacked a culture of experimentation and had fewer places to be disruptive due to a more hierarchical society, and having a more conservative mindset in the academic sector, where resources and support for risk taking by potential entrepreneurs was lacking. Surprisingly, while UK academic institutions were perceived to lack the innovative spirit which was praised in the US, participants with experience in European and UK institutions highlighted that the US and the UK were seen as very competitive and demanding environments. In contrast, it was reported that European academic institutions had a much better working environment with a healthier work-life balance. Some participants, particularly those who had recently left the UK, mentioned that racism was rising and that they had experienced recent xenophobic behavior within UK universities.

Participants commended the UK's funding streams – particularly from DFID, the Wellcome Trust and the MRC – and highlighted the fact that they have supported the development of some collaborative partnerships between UK institutions and those elsewhere, which has helped to generate solid funding for work conducted globally. However, the disadvantage, participants argued, is that UK institutes continue to be the lead partner, in spite of the attempted collaboration with well-established groups in LMICs. Some participants also raised concern that there is still a colonial and post-colonial orientation in the way the UK interacts with its partners, its attitude and assumptions, whereby UK development partners always do things in certain ways and do not adapt to the local context. Participants acknowledged, however, that this attitude was not unique to the UK and it was also present among Australian and US partners.

“ There needs to be solid work done to determine what effective partnerships are. There needs to be funding for research to understand what a partnerships is. A big scoping of what works, people are so dependent on funding (people in the global south), that they struggle to find a platform to voice their concerns ” (155)

## Risks

Several external participants mentioned immigration policies, the perception of the UK not being a welcoming place for others and the visa application process as posing key threats to conducting international research, hosting conferences and facilitating the exchange of students. Participants noted a perception that the UK's approach to health work globally has recently become unclear and poorly defined as there appears to be conflicting strategies, with some sectors using a more developmental approach and others having a more narrow commercial focus.

Some participants commented on the rise of competition to the UK's leading role in health globally, with a number of countries threatening to take over the UK's position. China and Japan were mentioned several times as emerging leaders that could potentially threaten the UK's position particularly as they have a different approach to development. This was mentioned by participants based in Africa, Asia, Europe and South America.

Overall, all participants were cautious about commenting on Brexit, given the level of political uncertainty at the time of interviewing. Most participants highlighted first that if the UK was going to become more “internal-looking”, “inward-looking” or “isolationist” and focus only on the UK situation, it would only have negative consequences on overseas aid policies and global health. Several participants highlighted that the clearest risk that the UK faces as a consequence of Brexit, is the reputational damage as one of the leading voices for health issues worldwide. Furthermore, it was suggested that the UK had already become weakened in terms of soft power. A few participants highlighted their perception that since both the UK and the US have been preoccupied by internal political issues and have stepped back from the global table on several key areas related to global health, other countries have felt less compelled to engage.

Specific concern was raised that the UK was less ambitious in global health compared to its previous leadership in the G7 and G8. Other participants already considered the UK an unreliable partner. It was suggested that the current political context is making the UK appear as though it cannot manage its own business or set its own agenda, and is no longer able to conduct some of the activities it used to. Other participants, particularly those that had left the UK recently, thought that the environment would become increasingly unwelcoming.

“ Look, I think that one of the biggest risks is that national interests start to dominate (...). So, I think that is the issue for the UK. (...) And instead of DFID having been a good citizen in the multilateral world of the Paris climate, IHP-plus, and all these different initiatives...how much of it will be more driven from a more narrow national self-interest viewpoint ” (176)

Participants based in the EU mentioned several specific areas where the UK could be negatively affected, depending on the exact terms of its departure from the EU and its future relationship. Participants noted potential risks to the availability and production of medicines and medical devices on both sides of the channel, as well as potential impacts to the recognition of professional qualifications, including those of doctors, nurses and pharmacists. Interviewees noted that the new EU legislation on data sharing could be a problem for the UK as it might hamper the possibilities of sharing data between the UK and other European countries and that the UK may no longer be able to use EU databases on medical devices, clinical trials and the safety of medicines. Some added that the UK may no longer have access to the central European application to combat falsified medicines. It was perceived that if the UK is no longer part of major EU collaborations between industry and academia, it would damage British science. Finally, without ensuring the free movement of scientists, participants believed that the British life sciences and global health research would be in a much weaker position.

## Opportunities

Several external interviewees considered there to be a real opportunity for change, to make globalisation work better and to improve the development of public health goals. There are certain areas where the UK will have the opportunity to lead, such as AMR which is a clear global security issue. External observers saw an exciting opportunity for the UK to build a more inclusive networked approach, instead of top-down, and to explore changes to the global health system which has been in place for the last forty years. Another opportunity for change identified by participants is to work with LMICs and take advantage of two-way flows of intelligence, seeing a sense of mutuality in global health.

External experts suggested that the UK could become “*the Bay Area of Europe*” (I72) that is the Silicon Valley of Europe with its higher education sector and its excellent computer science and mathematics relative to the rest of Europe. Other opportunities identified by informants included the UK becoming a platform for pharmaceutical innovation by being more agile in the pharmaceutical approval process compared to the US and the EU.

Participants mentioned that more funding could be made available to ODA that would normally go through the EU mechanisms. Other participants suggested that the potential loss of research funding from the EU would not be such a constraint, as the UK could secure a third-party agreement similar to the one established in Norway. It was also suggested that the potential loss of EU research funding could catalyze further government investment in research to make the UK a global hub for the life sciences industry.

Some highlighted that exiting from the EU might give the UK a stronger position to build a UK brand of leadership rather than always being linked to the EU. Special mention was made concerning the UK's role in Africa. Other interviewees highlighted the role that the UK could play in Central America and identified the opportunity of working bilaterally with countries in the region through DFID.

Some participants saw Brexit as an opportunity because if the UK is not focusing as much on Europe, it might engage more widely and broaden its international collaborations on various health issues. For example, participants highlighted that while having less influence within the EU, this could be an opportunity to become more engaged with some multilateral institutions, such as WHO and the OECD.

Other experts identified an important opportunity for the UK to make it easier and fairer for scientists from non-EU countries to immigrate, not just at a very senior level but across all tiers of migration for science. This would then compensate for the loss of European scientists.

Finally, some EU participants highlighted that due to the pressure of Brexit, some UK universities have already started to approach European partners to develop “*a Plan B or a strategy*” (I27) to make sure they still have access to EU funding, but also in general to stay connected with continental Europe. There was a sentiment highlighted by several participants that whatever the outcome with Brexit, partnerships and collaborations will still occur between the UK and European countries. Some participants even went further by suggesting that perhaps Brexit could lead to a counter trend where academia and civil society became more collaborative and in the long run it could be beneficial for the UK's footprint on health globally.

“ So if the government decided that, with the loss of EU funding for research, it was going to double down on funding and was going to make the UK a beacon of international life sciences research, which it could do, then that could be a good option. If the government decided that, with the loss of lots of European opportunities, instead of working collaboratively with European countries it wanted to stand out and take a lead, head and shoulders above Europe (...) – a bit like Singapore has done – that could be a good outcome ” (I72)

## 7: Concluding remarks

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The UK remains a global leader in health, to the benefit of its own citizens and economy and to the wider world. As detailed in the mapping review, the UK has world class universities and research institutes, is a global leader in health policy and international development, and is seeing unprecedented levels of investment and commitments to R&D, with a diverse not-for-profit sector. This is not only borne out in the published data but is reflected in the wider perceptions of those working in health, both inside and outside the UK. Perceptions matter and as the qualitative research reveals, national and international experts perceive the UK as having solid technical expertise, outstanding training and education and strong partnerships, underpinned by values, high scientific and business standards and a supportive funding environment for work in health and health science.

Just as important, however, are the weaknesses and threats to the UK's position globally. At this critical juncture for the UK, experts raised key concerns about the UK's immigration and visa policies, its perceived retreat from the global stage, a rise in inward-looking politics and, principally, the perceived potential damage from Brexit to the UK's reputation, research, economy and partnerships. Significant concern was raised about the growing threat to the 0.7% of GNI to ODA commitment.

It is encouraging that the Government is already moving to tackle some of these issues. These interviews show that, as we argue elsewhere, it is vital that the Government moves decisively to seize opportunities and manage these perceptions and risks.

Crucially, there are enormous opportunities for the UK to help further improve health globally, while also strengthening its own influence, standing and soft power. Experts from both inside and outside the UK encouraged UK actors to have a bold new vision, establish new partnerships and to harness its strengths in science and innovation to play an even more significant role in improving health globally. The set of actionable recommendations outlined at the beginning of this report set out a clear pathway for the UK to firmly and decisively establish itself as a unique global centre for health.

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