UK funding landscape for research capacity strengthening in low- and middle-income countries

UKCDR
UK Collaborative on Development Research

Briefing paper
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POLICY POINTERS

Initial recommendations for UK funders in research capacity strengthening (RCS):

Continue to increase institutional and systems RCS around individuals for a holistic approach and strengthen the enabling environment for research in LMICs e.g. through equitable partnerships.

Develop a joined-up, longer-term vision and approach to maximise the value of investments and for the sustainability of UK RCS investments.

Continue to ensure RCS investments are demand-led and move to in-country led models.

Explore opportunities for joined-up country and institutional support.

Look into potential models to support and consolidate support to countries and institutions with lower research capacity.

Look to expand RCS in other sectors beyond health.

Build the evidence base on what works in RCS through effective research and monitoring and evaluation so decisions and approaches in RCS are based on evidence.

Strong research and innovation capacities in low- and middle-income countries (LMICs) underpin socio-economic development. When countries tackle and collaborate on research for climate change, food security and the spread of epidemics, we all benefit. Research capacity strengthening (RCS) is about developing people and institutions, fostering collaborations across disciplines and sectors, building soft and hard supporting infrastructure, and a strong enabling environment including research culture and demand where research and research actors can thrive. Recent global work on COVID-19 diagnostics has shown that in a flatter and more equally threatened world, we can all benefit from globally and equitably distributed efforts to create research capacity. This briefing paper summarises UK-funded contributions to this landscape between 2016 and 2021, along with initial policy recommendations to UK funders.

INTRODUCTION

The UK has a long tradition of outstanding research for and with LMICs and has invested significantly to strengthen research capacity and the enabling environment for research in LMICs over many decades. The UK has and continues to play a key partnership role in strengthening skills, systems and collaborations and building a critical mass of researchers.

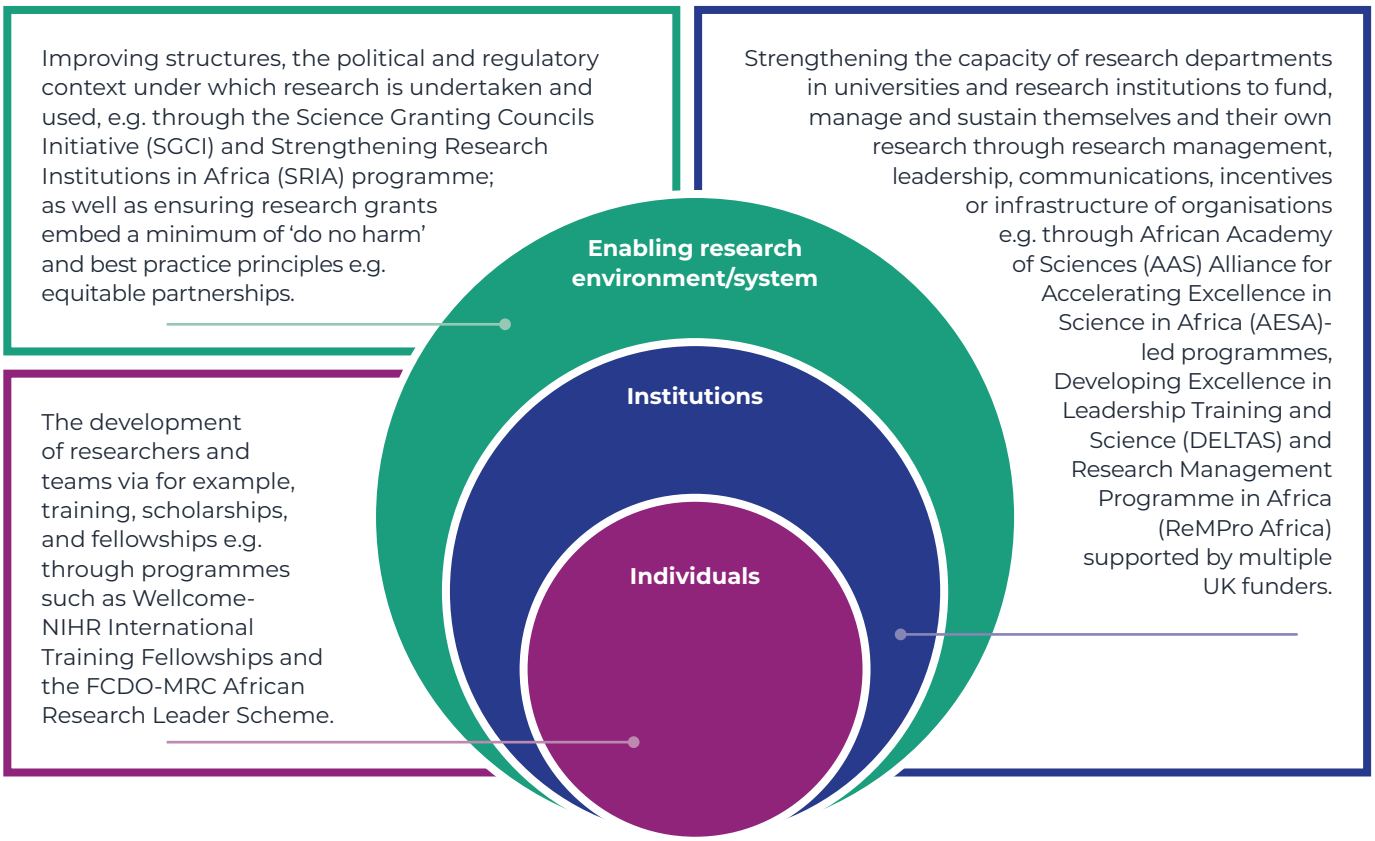
The UK Government restated its commitment to research capacity strengthening for development in its response to the 2012 House of Commons Science and Technology Committee report on *Building Scientific Capacity for Development*[1]. Research Capacity Strengthening (RCS) are initiatives aimed at "enhancing the ability and resources of individuals, institutions and/or systems to undertake, communicate and/or use high quality research efficiently, effectively and sustainably". UK funders support RCS through either stand-alone initiatives (dedicated programmes where strengthening capacity is the primary/sole purpose in one location or a variety of locations) or embedded as part of research programmes. UK research funders aim to impact on different interacting levels of research ecosystems in LMICs (see Figure 1).

It is well recognised by UK research funders that for research and research capacity impact to be sustainable, research and capacity need to be embedded in national systems and led by national research institutions in the long term. Capacity is needed at the individual, institutional and environment/system level with comprehensive support to individuals and organisations across the research chain; and a long-term approach is essential to have an impact.

1 Science and Technology Committee (2012) Building Scientific Capacity for Development, Fourth Report of Session 2012–13 (pdf)

Figure 1: Research capacity strengthening by UK funders targets different (interacting) 'levels' of the research ecosystem

Capacity can be strengthened at one or more different and interacting levels – at the individual, institutional and the enabling environment/ ecosystem level in LMICs – as outlined in the diagram below with examples of UK initiatives.



About this report

In 2020, the UK Collaborative on Development Research (UKCDR) mapped and analysed 133 UK-funded RCS programmes through desk-based research[2] and collation of data from UK funders across different categories. This analysis builds on a mapping of UK-funded fellowships and scholarships for Africa in 2019[3], and previous mappings on UK and international capacity strengthening priorities (2015)[4] and over 300 global health research capacity initiatives (2014)[5].

This brief provides an overview of UK Government and Wellcome investments into research capacity strengthening in LMICs and offers initial recommendations for the future sustainability, coherence and impact of UK investments. This analysis is part of a UKCDR led cross-funder review of UK-funded research capacity strengthening in LMICs to understand the scope, extent and learning from UK-funded programmes. Case study examples of impact and coherence were also developed to accompany the analysis. See 'UK ODA and Wellcome-Funded Research Capacity Strengthening in LMICs: Case Studies'. This analysis will be built upon in a learning piece involving interviews and a learning workshop with UK and international stakeholders. A learning output will be published in 2022. These outputs are aimed at UK funders, senior decision-makers, programme leads and practitioners in RCS and oversight bodies for Official Development Assistance (ODA) research funding.

Her Majesty's Government Strategic Coherence of ODA-funded Research (SCOR) Board, set up in 2018, governs the UKCDR which convenes major UK government departments and research funders in international development. It aims to ensure ODA-funded science and research investments are having maximum impact on international development outcomes and the strengthening of sustainable scientific and research systems in LMICs.

2 Raynor, B. (2020) BEIS RCS Review (internal report) and Fosci, M., Loffreda, L., Velten, L., Johnson, R. (2019) Research capacity strengthening in low- and middle-income countries.
3 Kunaratnam, Y., Waage, J., Bucher. A, Boyd, C. (2020) A mapping & analysis of UK-funded fellowships & scholarships for Africa.
4 Enoch, J. (2015) Rapid mapping of international funders' research capacity strengthening priorities.
5 Enoch, J. (2014) Health research capacity strengthening: A UKCDS mapping.

UK INVESTMENTS IN RESEARCH CAPACITY STRENGTHENING IN LMICS

This section outlines key findings from UKCDR's analysis of 133 UK-funded RCS programmes with an overview of high-level findings presented in Figure 2.

Figure 2: Snapshot of UK research capacity strengthening (RCS) investments in LMICs (2016-21)

The UK has made significant investments into RCS in LMICs

£873m

spent on 71 standalone RCS programmes between 2016-2021.

£1.2bn

was also spent on 62 research programmes that feature a significant embedded RCS component.

Most RCS programmes (80.5%) are directed towards supporting Africa

Particularly Eastern, Southern and Western Africa. Top six country beneficiaries: Kenya, South Africa, Uganda, Ghana,Tanzania and India. Overall, countries with lower ranked R&D systems benefit from less support.

Most common beneficiaries of RCS support are African Universities

incl. University of Cape Town, Makerere, Witwatersrand, Ghana, Ibadan, and Stellenbosch. Several institutions receive investment from multiple UK-funded RCS programmes

A total of 871 institutions and 135 countries supported.

70% of programmes support multiple countries.

SDG 3 Good Health & Wellbeing

is the most common thematic focus of RCS programmes (50%).

Majority of UK RCS support is focused on strengthening at the individual level

(53.4%) although there is movement towards more institutional and environmental/ systems level.

21% of programmes co-funded by UK funders.

Coherence, complementarity and coordination in RCS exists between UK funders, but there is space for better join up.

Most commonly-used RCS approaches:

Collaboration (59.4%) **Training** (48.9%), and **Networks/Networking**

Most common focus areas of RCS support:

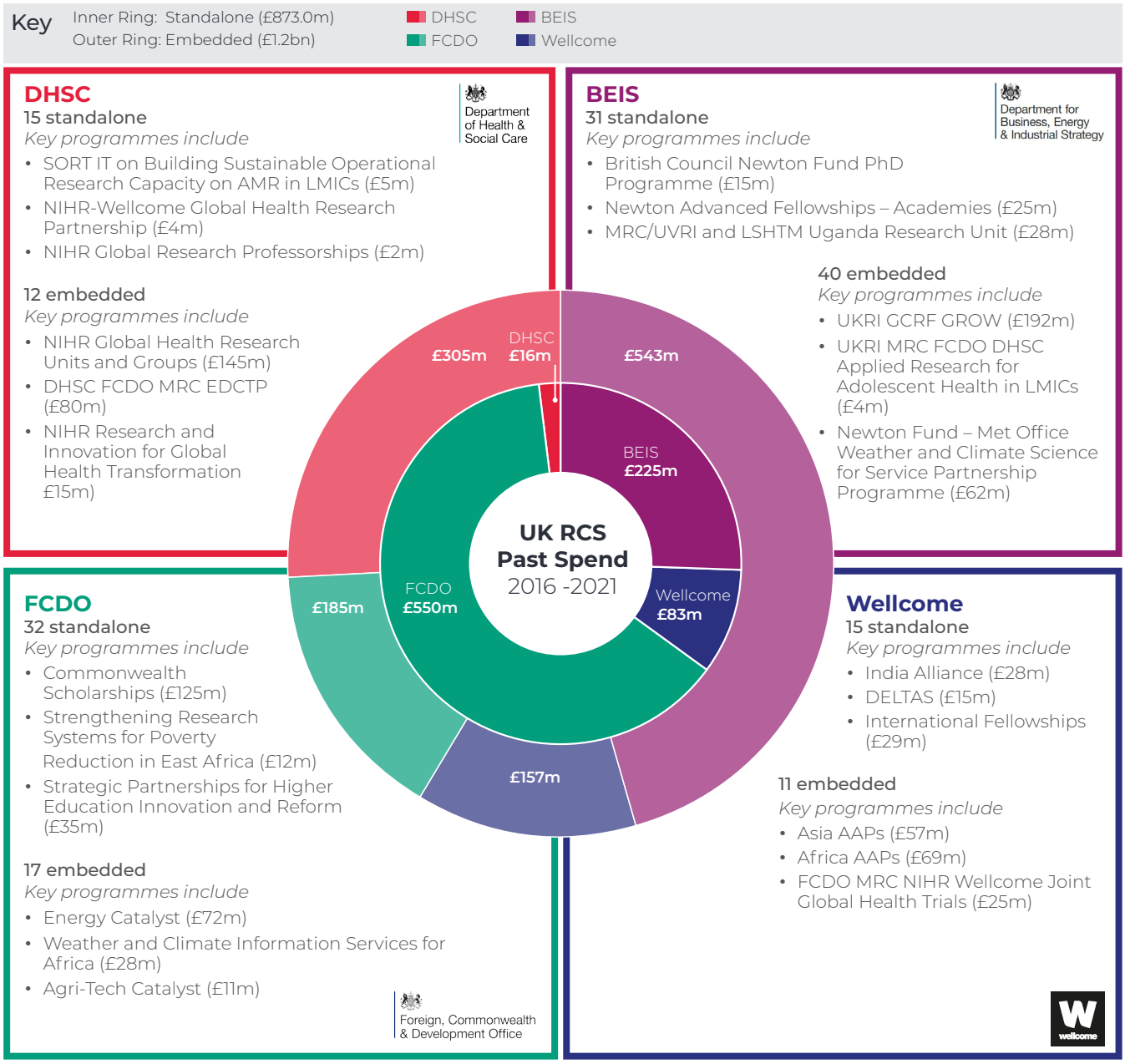
Research production (57.9%) and **Communications/uptake** (31.6%), and other areas (research demand, leadership, grant management, innovation) to enhance sustainability and impact.

UK RCS investments from the UK's Department for Business, Energy and Industrial Strategy (BEIS), Foreign and Commonwealth Development Office (FCDO), Department for Health and Social Care (DHSC) and Wellcome.

The UK has made significant investments into research capacity strengthening in LMICs

Over the last five financial years (FY) (2016-2021), the UK has invested approximately £873m in LMICs through 71 standalone RCS programmes. This embraces active programmes during the period funded by the Department for Business, Energy and Industrial Strategy (BEIS), Foreign and Commonwealth Development Office (FCDO) - formerly the Department for International Development (DFID) - Department for Health and Social Care (DHSC) and Wellcome. This is in addition to the £1.2bn that was spent by UK funders over the past five years on a further 62 research programmes that embed a significant component of RCS. See Figure 3 for a breakdown by UK funder with highlighted RCS programmes. FCDO (£549.7m) and BEIS (£224.6m) are the largest funders of standalone RCS programmes, followed by Wellcome (£82.8m). For research programmes with significant embedded RCS, BEIS (£543.0m) and DHSC (£304.7m) have spent the greatest funds over the last five years.

Figure 3: Past spend by UK funders on standalone and embedded RCS programmes (FY 16/17 – 20/21)[6]



NOTE: The financial information presented in Figure 3 only shows the total expenditure by funders on programmes during the five-year period between FY 2016/17 and 20/21. The figure does not reflect the overall financial commitments made by funders over the lifespan of a given RCS programme.

6 It is important to note as in UKCDR's A Mapping & Analysis of UK-funded Fellowships & Scholarships for Africa (2020), scholarship and fellowship schemes vary in the extent to which they specifically target research capacity. All schemes from this study have been included in this mapping for consistency (subject to meeting the inclusion criteria – see Methodology in Annex 4).

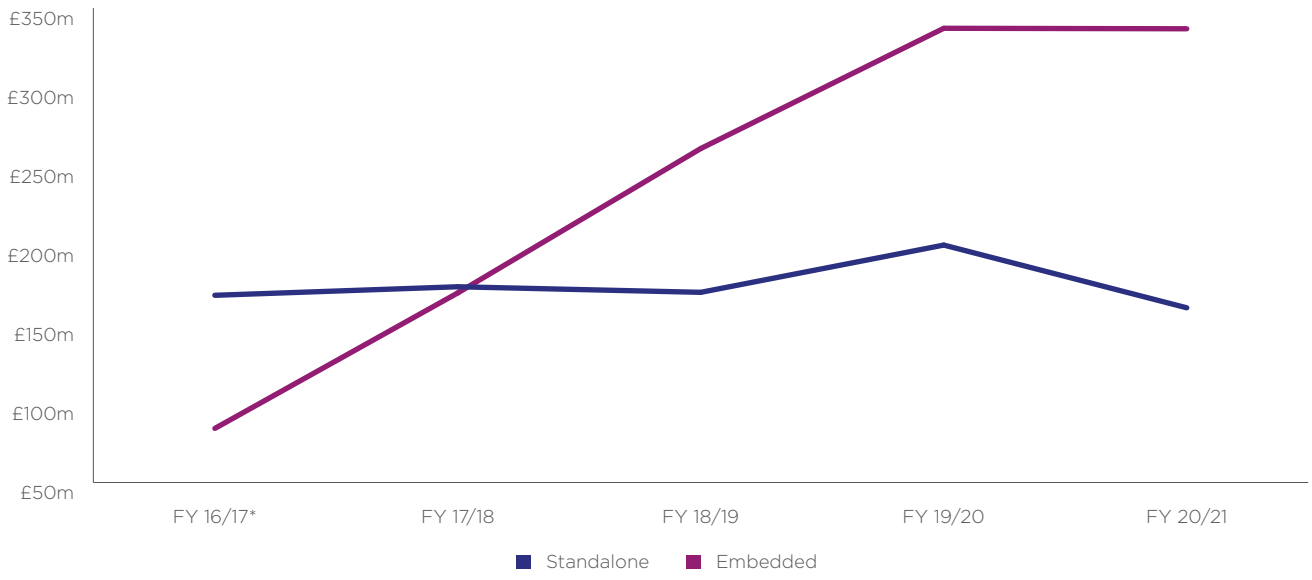
While UK spend on standalone programmes has been consistent, spend on embedded research capacity strengthening has increased significantly

Looking at how UK funding has changed over time, Figures 4 and 5 show that spend by funders on standalone RCS programmes remained largely constant during the five-year period. The average growth rate of this spend was -0.3%, however, this figure is largely impacted by the significant decrease in spend (19.8%) between FY 19/20 and 20/21. This decrease (the second time that a year-on-year decrease in spend took place during the five-year period under consideration) was mainly driven by the cumulative impact of FCDO spending, £29m less in FY 20/21 than the previous financial year[7]. Spend on standalone programmes was greatest during FY 19/20 when UK funders collectively spent £200m (see Figure 4).

Figures 4 and 5 also show a continuous increase in spend-per-year over the last five years on embedded RCS programmes – increasing at an average rate of 46% and more than doubling in the one-year period between FY 16/17 and 17/18. This increase was largely due to BEIS and DHSC starting to spend more funds following the redistribution of ODA funds across government departments in 2015. In particular, this was primarily driven by the launch, within this period, of the two embedded RCS programmes with the largest average annual spend – namely the NIHR Global Health Research Units and Groups (average annual spend of £36m), and the Global Challenges Research Fund (GCRF) Grow Capability Programme (average annual spend of £48m). From the data, there was a slight decrease in spend between FY 19/20 and 20/21 (with funders collectively spending £305k less in 20/21 compared to the previous year – representing a reduction of 0.1%). The greatest spend on embedded programmes took place during FY 19/20 when UK funders collectively spent £337m (see Figure 4).

The data collected focuses on past spend in the five-year period between April 2016 to March 2021, and therefore these figures have not been significantly affected by the reduction in the UK ODA budget from 0.7% to 0.5% of Gross National Income (GNI) announced in November 2020. This data, however, will be useful for guiding and making the case for investments in RCS in the future and potentially for comparing against future data to assess some of the longer-term impacts of the ODA cuts.

Figure 4: Total spend on RCS programmes by UK funder (FY 16/17 – 20/21)

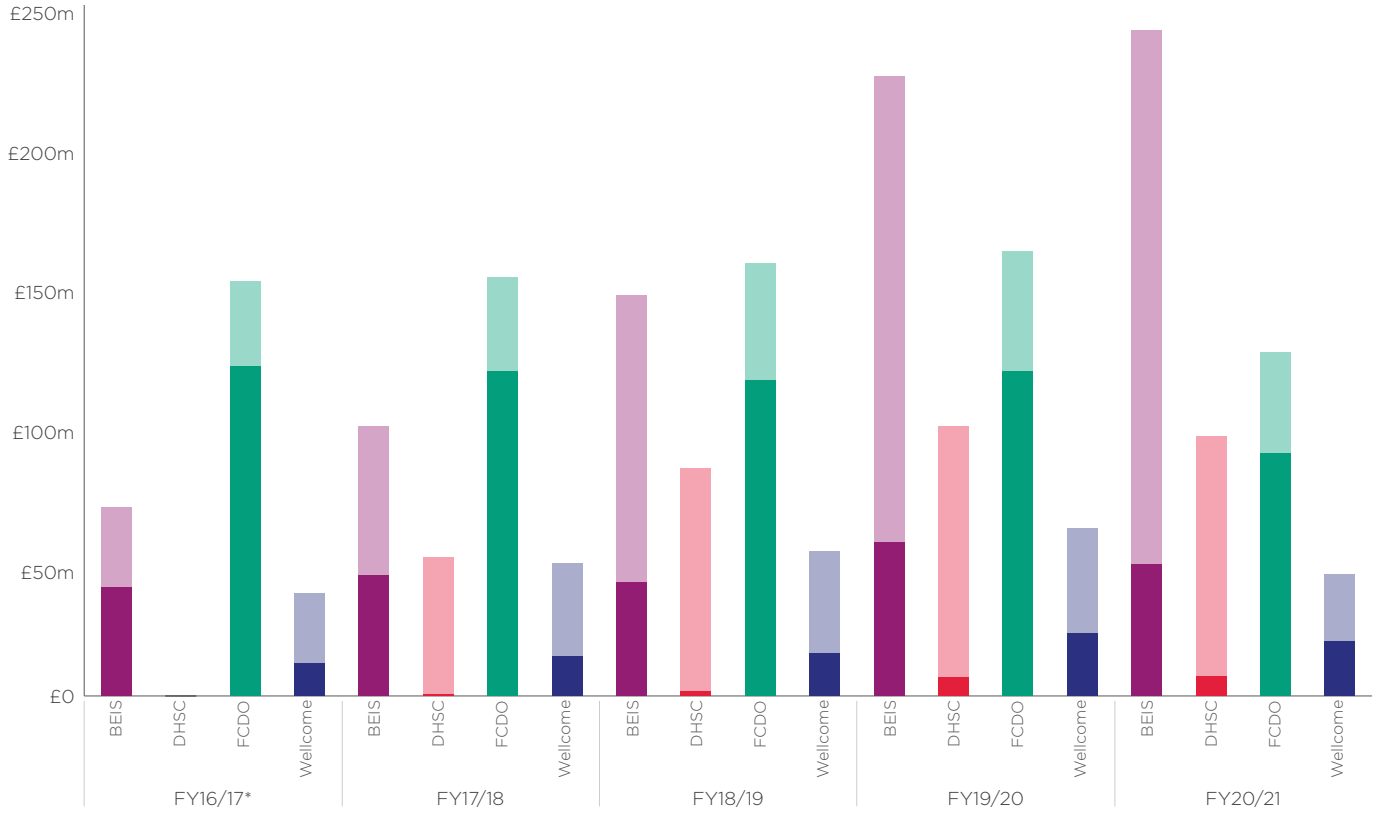


Financial information available for 121 out of 133 RCS programmes.

*Spend data for one longstanding standalone programme (Chevening Scholarships) was unavailable for FY 16/17 and was subsequently estimated using that programme's average annual spend between FY 17/18 and 20/21. See Annex 4.

7 The decrease in expenditure by FCDO between FY 19/20 and 20/21 was not driven by the completion of programmes in 2020/21 that were active in 2019/20 (of which there were two). Rather, 8 different programmes saw their expenditure reduce by £1m or more during this period – most notably the Chevening Scholarship (reduction of £12.2m) and the Strategic Partnerships for Higher Education Innovation and Reform (reduction of £6.7m) programmes.

Figure 5: Distribution of spend on RCS programmes by UK funder (FY 16/17 – 20/21)



Darker shade = Standalone RCS Programme; Lighter shade = Embedded RCS Programme

Financial information available for 121 out of 133 RCS programmes.

*Spend data for one longstanding standalone programme (Chevening Scholarships funded by FCDO) was unavailable for FY 16/17 and was subsequently estimated using that programme's average annual spend between FY 17/18 and 20/21. See Annex 4.

UK funders bring different and complementary added value to research capacity strengthening support in LMICs increasing their ability to have impact across levels and disciplines

FCDO and Wellcome have invested significantly in major RCS programmes in LMICs for many decades. From traditionally supporting individual researchers through training and fellowships, they have diversified their approaches towards also supporting research teams, institutions, and more recently national research systems and ecosystems. BEIS (including through UKRI, with the exception of UKRI-MRC who has a longer tradition of international research funding and engaging in RCS in LMICs) and DHSC (including through NIHR), are relatively new players to the field of international development research, primarily since the redistribution of ODA funds in 2015. This has changed the UK funding landscape for international development research and capacity strengthening. Within their ODA research programmes, they have supported capacity strengthening through partnerships between UK and LMIC research institutes, with a focus on equitable partnerships and developing the capacity of individuals in producing excellent research across disciplines. Capacity building partnerships often have spin-off effects in supporting the UK to be a partner of choice for future collaborations. More recently, their support is also beginning to include more institutional and systems RCS.

Coherence and coordination in research capacity strengthening exists between UK funders but there is space for better join up

There is active communication and coordination between UK research funders, facilitated through UKCDR and other mechanisms. Collaboration between UK funders, as well as with international funders has been positive and helps to ensure strategic alignment, coherence, learning, good practice, less duplication and resourcing for key areas of RCS in LMICs that would not be possible through a single funder. Our analysis found co-funding relationships amongst the four UK research funders in 21% of the programmes including, for example, in the Research Management Programme in Africa (ReMPro) supported by multiple UK funders; and could be further built upon to enhance coordination and coherence. Additionally, there is space for better cross-department join up and visibility of investments to secure a strong outcome.

For the past 10 years UKCDR has convened the UKCDR Research Capacity Strengthening Group (RCSG)[8] which brings together over 20 UK funding and practitioner organisations to share, learn, connect and improve practice. This has helped to facilitate joint working and collaboration between UK organisations. The international ESSENCE on Health Research Initiative[9] coordinates international funders work on health research and is developing a 'Mechanism for Reviewing Investments in Health Research Capacity Strengthening in LMICs' to enable funders to review their investments and collaboratively identify and address gaps in countries with the highest burden of disease and lower research capacity[10]. These will continue to be important mechanisms to improve strategic coherence and impactful investments in LMICs.

UK investments aim to align with the research and capacity needs and priorities of LMICs

UK funders have adopted a range of mechanisms which seek to ensure that expenditure reflects the needs of recipient countries. UK funders have conducted a range of RCS needs assessments for example in LMICs[11], Africa[12], health[13] and research management[14] to better understand context and needs in-country and work in partnership with LMICs to address these. A shift towards equitable partnerships by all UK funders, guided by UKCDR work on cross-cutting funder principles[15], and bilateral dialogue between UK and partner country governments through for example the Newton Fund has also enabled joint agenda setting.

UK-funded research capacity strengthening is across different levels and institutional and systems level support is increasing

It is widely recognised that a holistic focus across all levels of the research ecosystem enhances effectiveness, and that individual-level investments can have greater impact when integrated with investment in strengthening institutions and systems for research capacity and vice versa[16]. UK funder investments often aim to have impact at more than one level (found in 52% of programmes).

Table 1: UK-funded RCS programmes primary level of focus (percentages of programme type for each level indicated in brackets).

RCS programme type	Individual level	Institutional level	Environmental/ systems level
Embedded	36	26	12
(62 programmes)	(58%)	(42%)	(19%)
Standalone	35	19	25
(71 programmes)	(49%)	(27%)	(35%)
Overall	**71**	**45**	**37**
(133 programmes)	**(53%)**	**(34%)**	**(28%)**

Individual programmes may be classified against multiple levels.

Information on primary RCS level of focus available for 124 out of 133 RCS programmes.

As indicated in Table 1, the majority of UK support is primarily focused on supporting individual level capacities (in 53% of all UK-funded RCS programmes) particularly on the capacities of researchers to produce high-quality research, to help build and sustain a critical mass of researchers in-country and support research career pathways. Overall, just

8 https://www.ukcdr.org.uk/what-we-do/our-funder-groups/research-capacity-strengthening-group/
9 https://www.who.int/tdr/partnerships/essence/en/
10 Kilmarx, P.H., Maitin, T., Adam, T., Akuffo, H., Aslanyan, G., Cheetham, M., Corrêa-Oliveira, R., Kay, S., Khelef, N., Kunaratnam, Y., Kupfer, L. and Olesen, O.F. (2020). A Mechanism for Reviewing Investments in Health Research Capacity Strengthening in Low- and Middle-Income Countries. Annals of Global Health, 86(1), p.92.
11 Fosci, M., Loffreda, L., Velten, L., Johnson, R. (2019) Research Capacity Strengthening in Low- and Middle-Income Countries.
12 Fosci, M. et al. (2020) Strengthening Research Institutions in Africa: Seven Country Needs Assessments.
Frost, A.I. et al. (2020) Understanding knowledge systems and what works to promote science technology and innovation in Kenya, Tanzania and Rwanda.
13 LSE (2021) Building the Case for Investment in Health Science Research in Africa.
14 Consort (2017) Scoping Work on Research Management in LMICs in Sub-Saharan Africa and India.
15 Dodson, J. (2017) Finding and building effective and equitable research collaborations or partnerships.
16 FCDO (2010) How to note: Capacity building in Research.

over a third (34%) of UK-funded RCS programmes are focused at the institutional level and 28% at the environmental/systems level. When looking at standalone RCS programmes only, 27% are focused on RCS at the institutional level and 35% at the environmental/systems level. Balanced support across different levels is critical to supporting the whole research ecosystem.

UK-funded research capacity strengthening support is focused on research production but diversifying to new areas to enhance sustainability and impact

The most common focus of RCS support is on research production (57.9%) followed by research communications/uptake capacities (31.6%). However, focus by UK funders has shifted to new areas. There are several UK programmes looking to strengthen entrepreneurship/innovation capacities (18.8%), research leadership (18.0%), research and grant management including financial structures (16.5%) and research funding (12.8%) which are key to sustaining capacity and promoting research impact in LMICs. For example, the FCDO-MRC African Research Leader Scheme, and Wellcome and FCDO support to establish the Alliance for Accelerating Excellence in Science in Africa (AESA), an initiative to manage grants and provide leadership for scientific research in Africa in partnership with the African Academy of Sciences (AAS)/AESA and African Union Development Agency (AUDA-NEPAD). ReMPro Africa supported by Wellcome, FCDO, BEIS (through UKRI and the Royal Society) and DHSC aims to support professionalisation in the research management sector in Africa, led by AAS/AESA; and FCDO is co-funding the Science Granting Councils Initiative (SGCI) to strengthen the capacity of 15 research funding councils in Africa. In addition, programmes such as Leaders in Innovation Fellowships (LIF) run by the Royal Academy of Engineering aims to enhance individual research innovation capacities. This diversification of capacity strengthening support enhances impact and sustainability. The full range of programmes and areas of support by UK funders at different levels of the research ecosystem can be found in Annex 1 and 2.

UK-funded research capacity strengthening programmes tend to use more implicit approaches

The most used approaches in UK-funded RCS programmes are collaboration (59.4%), training (48.9%), and networks/networking (37.6%). In the case of the latter, this involves both building research and professional networks and networking grants for researchers to foster collaborations. There tends to be greater emphasis on using training-based and knowledge exchange approaches and implicit RCS through research collaborations and equitable partnerships in UK-funded programmes. This is particularly common in UK-funded embedded RCS programmes where there is a greater focus on research excellence with RCS as a secondary objective. Other more explicit RCS approaches used in addition to training include fellowships/scholarships, good practice/standards, coaching/mentoring and institutional funding.

Geographically, there has been significant UK investment in research capacity strengthening in Africa but countries with lower ranked R&D systems benefit from less UK support

In total, 107 UK-funded RCS programmes (80.5%) are investing in Africa due to strong demand[17] and the UK Government's commitment to work alongside, invest in and partner with African nations. UK investment has been focused predominantly in East (60.2% of all programmes), Southern (51.1%) and West Africa (48.1%). This is followed by Southern Asia (40.6%), Southeast Asia (38.3%) South America (32.3%) and Western Asia (24.1%)[18] . The analysis also showed that 70% of programmes support multiple countries.

17 Science, technology and innovation are central pillars to the African Union's Science Technology and Innovation Strategy for Africa (STISA 2024) and Agenda 2063.

18 Geographic regions defined by UN Statistics Division. Many UK-funded RCS programmes have multiple countries and regions of focus so percentage total across regions is greater than 100%.

Table 2: Top 15 countries by number of programmes listed as benefitting from UK ODA and Wellcome-funded RCS investments between 2015 and 2020 (in brackets: number of standalone, embedded and total RCS programmes)[19]

Least developed and low Income	Lower-middle income	Upper-middle income
Uganda (21, 30, total 51)	Kenya (28, 30, total 58)	South Africa (22, 34, total 56)
Tanzania (16, 25, total 41)	Ghana (23, 23, total 46)	Brazil (15, 15, total 30)
Zimbabwe (12, 22, total 34)	India (15, 22, total 37)	
Malawi (13, 20, total 33)	Nigeria (17, 19, total 36)	
Ethiopia (16, 16, total 32)	Vietnam (15, 15, total 30)	
Zambia (12, 15, total 27)	Indonesia (12, 16, total 28)	

Individual research programmes may list multiple benefitting countries.

As the data provided for this analysis was provided at the programme level, the distribution of individual projects across countries may not be the same as at the programme level.

Information on individually named benefitting countries available for 99 out of 133 RCS programmes.

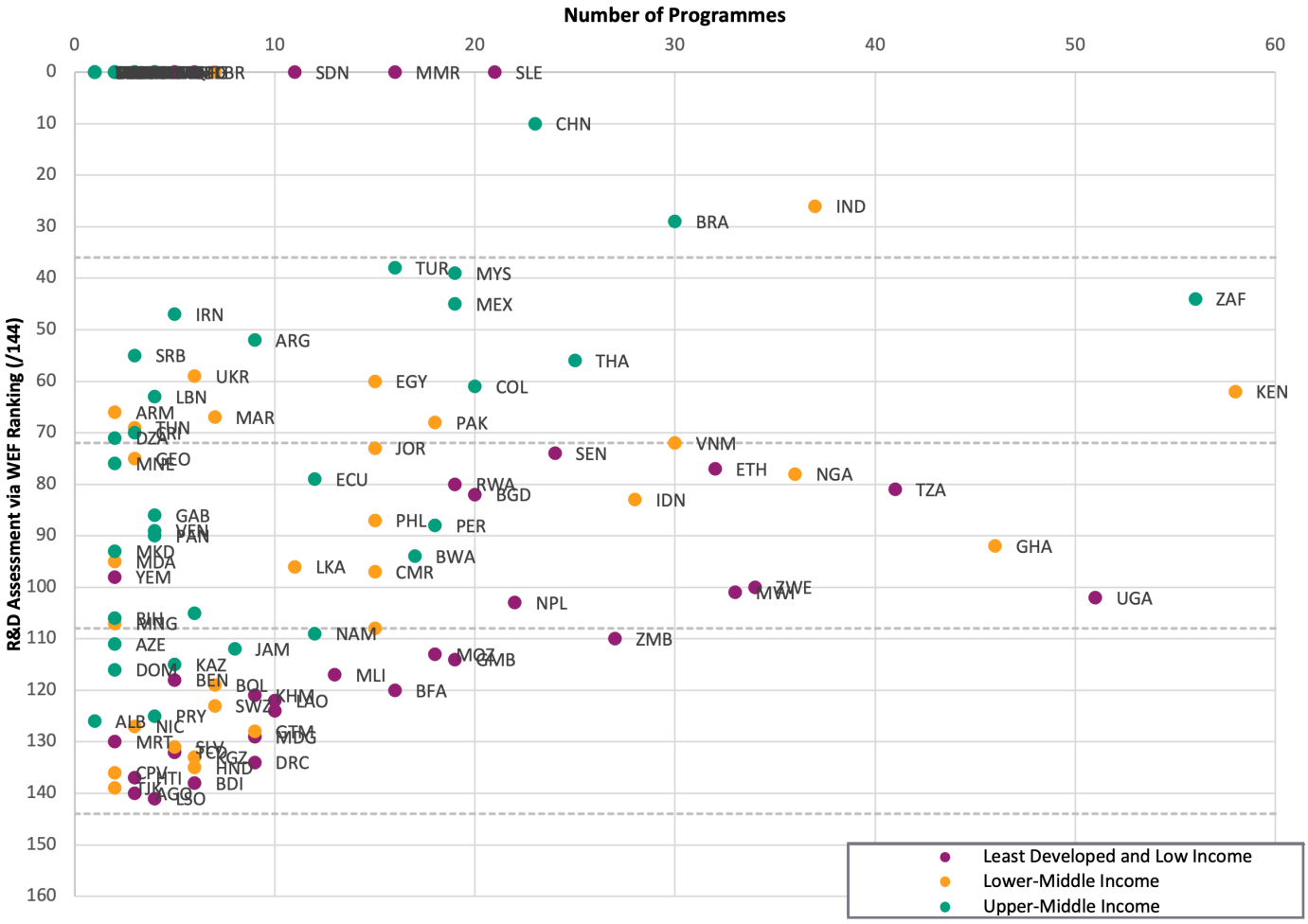
Table 2 shows there is a mix of UK support to countries with stronger ranked R&D systems (e.g. South Africa and Kenya) and those with lower ranked R&D systems (e.g. Uganda and Malawi)[20]. When cross-referencing each of the listed countries against the global ranking of national research and development systems by the World Economic Forum (as part of their annual Global Competitiveness Index), our analysis showed, however, that overall there are fewer UK-funded RCS programmes for countries with lower ranked R&D systems (see Figure 6).

There is a total of 45 ODA eligible countries and territories named as benefitting from just one or two RCS programmes – including Central African Republic, Djibouti and Eritrea. Additionally, eight further ODA eligible countries and territories are not benefitting from UK ODA and Wellcome funded RCS investments – including Comoros (ranked among the lowest income countries), Equatorial Guinea, and Tokelau. The regions benefitting from less than 10% of the number of RCS programmes are: the Caribbean (9.8%), Melanesia (8.3%), Eastern Europe (7.5%), Southern Europe (4.5%), Micronesia (3.8%), and Polynesia (3.8%). As for other regions with comparatively fewer RCS programmes, these include Northern Africa (21.8%), Central America (21.1%), Eastern Asia (21.1%), Central Africa (19.5%), and the Central Asia (10.5%).

19 Income group classification in Table 2 determined by OECD DAC List of ODA Recipients.

20 Ranking of national R&D systems (out of 144) by World Economic Forum (WEF) Global Competitiveness Report 2020: India (26), Brazil (29), South Africa (44), Thailand (56), Kenya (62), Vietnam (72), Ethiopia (77), Nigeria (78), Tanzania (81), Indonesia (83), Ghana (92), Zimbabwe (100), Malawi (101), Uganda (102).

Figure 6: Low-and middle-income countries (as classified by the OECD DAC List of ODA Recipients) benefitting from UK-funded RCS programmes by number of programmes and World Economic Forum (WEF) Global Competitiveness Report ranking of national Research & Development (R&D) systems.



Country Abbreviations: AFG - Afghanistan; **AGO** - Angola; **ALB** - Albania; **ARG** - Argentina; **ARM** - Armenia; **ATG** - Antigua & Barbuda; **AZE** - Azerbaijan; **BDI** - Burundi; **BEN** - Benin; **BFA** - Burkina Faso; **BGD** - Bangladesh; **BIH** – Bosnia & Herzegovina; **BLR** - Belarus; **BLZ** - Belize; **BOL** - Bolivia; **BRA** - Brazil; **BTN** - Bhutan; **BWA** - Botswana; **CAF** - Central African Republic; **CHN** - China; **CIV** - Cote d'Ivoire; **CMR** - Cameroon; **COG** - Congo (Rep.); **COL** - Colombia; **CPV** - Cabo Verde; **CRI** - Costa Rica; **CUB** - Cuba; **DJI** - Djibouti; **DMA** - Dominica; **DOM** - Dominican Republic; **DRC** - Democratic Rep. Congo; **DZA** - Algeria; **ECU** - Ecuador; **EGY** - Egypt; **ERI** - Eritrea; **ETH** - Ethiopia; **FJI** - Fiji; **FSM** - Micronesia; **GAB** - Gabon; **GEO** - Georgia; **GHA** - Ghana; **GIN** - Guinea; **GMB** - Gambia; **GNB** – Guinea Bissau; **GRD** - Grenada; **GTM** - Guatemala; **GUY** - Guyana; **HND** - Honduras; **HTI** - Haiti; **IDN** - Indonesia; **IND** - India; **IRN** - Iran; **IRQ** - Iraq; **JAM** - Jamaica; **JOR** - Jordan; **KAZ** - Kazakhstan; **KEN** - Kenya; **KGZ** - Kyrgyzstan; **KHM** - Cambodia; **KIR** - Kiribati; **KOS** - Kosovo; **LAO** - Laos; **LBN** - Lebanon; **LBR** - Liberia; **LBY** - Libya; **LCA** - St Lucia; **LKA** - Sri Lanka; **LSO** - Lesotho; **MAR** - Morocco; **MDA** - Moldova; **MDG** - Madagascar; **MDV** - Maldives; **MEX** - Mexico; **MKD** - Macedonia; **MLI** - Mali; **MMR** - Myanmar; MNE - Montenegro; **MNG** - Mongolia; **MOZ** - Mozambique; **MRT** - Mauritania; **MSR** - Montserrat; **MUS** - Mauritius; **MWI** - Malawi; **MYS** - Malaysia; NAM - Namibia; **NER** - Niger; **NGA** - Nigeria; **NIC** - Nicaragua; **NPL** - Nepal; **PAK** - Pakistan; **PAN** - Panama; **PER** - Peru; **PHL** - Philippines; **PNG** - Papua New Guinea; **PRK** - North Korea; **PRY** - Paraguay; **PSE** - West Bank & Gaza Strip; **RWA** - Rwanda; **SDN** - Sudan; **SEN** - Senegal; **SHN** - St Helena; **SLB** - Solomon Islands; **SLE** - Sierra Leone; **SLV** - El Salvador; **SOM** - Somalia; **SOM2** - Somaliland; **SRB** - Serbia; **SSD** - South Sudan; **STP** - Sao Tome & Principe; **SUR** - Suriname; **SWZ** - Eswatini; **SYR** - Syria; **TCD** - Chad; **TGO** - Togo; **THA** - Thailand; **TJK** - Tajikistan; **TKM** - Turkmenistan; TLS - Timor Leste; **TON** - Tonga; **TUN** - Tunisia; **TUR** - Turkey; **TUV** - Tuvalu; **TZA** - Tanzania; **UGA** - Uganda; **UKR** - Ukraine; **UZB** - Uzbekistan; **VCT** - St Vincent; **VEN** - Venezuela; **VNM** - Vietnam; **VUT** - Vanuatu; **WSM** - Samoa; **YEM** - Yemen; **ZAF** - South Africa; **ZMB** - Zambia; **ZWE** – Zimbabwe.

To distinguish between stronger and weaker national R&D systems, UKCDR divided the WEF ranking (out of 144) into four equal groups: High Ranking (1st – 36th), Upper-Medium Ranking (37th – 72nd), Lower-Medium Ranking (73rd – 108th), Lowest Ranking (109th – 144th). These groups are reflected in the above figure through the use of the dotted lines.

Individual research programmes may list multiple benefitting countries.

Information on individually named benefitting countries available for 99 out of 133 RCS programmes.

Countries that were not included in the WEF Global Competitiveness Report have been assigned a ranking of 0 in the above chart (48 out of 135 listed countries).

African universities are key beneficiaries and several institutions receive investment from multiple UK-funded research capacity strengthening programmes

As highlighted in Table 3, African universities are key beneficiaries of UK-funded RCS activities with all named institutions receiving investment from 9 to 21 UK-funded programmes[21]. There is again a mix of UK support for higher ranked research institutions (University of Cape Town and Witwatersrand) and lower ranked institutions (e.g. University of Ghana, Nairobi and Makerere)[22] .

Table 3: Key institutions benefitting from UK-funded RCS (in brackets: number of standalone and embedded RCS programmes with total**)**

Least developed and low income	Lower-middle Income	Upper-middle income
Makerere University, Uganda (7, 13, total 20)	University of Ghana, Ghana (5, 10, total 15)	University of Cape Town, South Africa (7, 14, total 21)
University of Addis Ababa, Ethiopia (4, 8, total 12)	University of Ibadan, Nigeria (6, 7, total 13)	University of the Witwatersrand, South Africa (8, 9, total 17)
University of Malawi (3, 9, total 12)	University of Nairobi, Kenya (2, 7, total 9)	Stellenbosch University, South Africa (6, 7, total 13)
University of Zimbabwe (3, 9, total 12)		University of KwaZulu-Natal, South Africa (5, 6, total 11)
		University of Pretoria, South Africa (4, 5, total 9)

Individual research programmes may list multiple benefitting institutions.

Information on individually named benefitting institutions available for 61 out of 133 RCS programmes.

The UK's research capacity strengthening expertise and support are concentrated in health research

Half of UK RCS programmatic support considered in this analysis were relevant to the SDG on 'good health and well-being' – far outnumbering all other SDGs (see figure 2). This is expected given that, among the UK funders under consideration, the portfolio of two of these funders (namely DHSC and Wellcome) focus almost exclusively on health-related research. Furthermore, even in the case of BEIS and FCDO, ODA spend has historically been highest on health-related research relative to other thematic areas, although support to different disciplines and interdisciplinary research has been increasing. The SDGs with the second-largest number of programmes, namely 'zero hunger' and 'innovation, industry and infrastructure', were relevant to 12% of programmes. Other relevant SDGs prominent among RCS programmes included those around 'peace, justice and strong institutions' and 'sustainable cities and communities' and 'climate action'[23]. RCS support to wider disciplines is mainly through BEIS' funding through GCRF and the Newton Fund and FCDO funding.

21 Programmatic support can vary from several fellowships to a multi-million-pound award.

22 Rankings from 'Times Higher Education World University Ranking': Rank (out of 1,001+), Uni. Cape Town (136), Uni. Witwatersrand (194), Stellenbosch Uni. (251-300), Uni. KwaZulu-Natal (401-500), Uni. Ibadan (501-600), Makerere Uni. (601-800), Uni. Ghana & Uni. Nairobi (801-1,000).

23 A significant portion of standalone RCS programmes (13.5%) could not be mapped directly onto the SDGs as they were more relevant to enhancing research management processes or to be determined following funding decisions.

RECOMMENDATIONS

There are opportunities for greater coherence between UK funders to leverage the significant investment into RCS in LMICs (and ensuing scale up of partnerships with researchers, entrepreneurs and institutions in LMICs) to advance progress towards the Sustainable Development Goals. Several initial recommendations have emerged to enable greater impact, sustainability, and coherence of UK RCS investments:

- **Continue to increase institutional and systems research capacity strengthening support around individuals for a holistic approach** including a focus on strengthening the enabling environment for research in LMICs through areas such as equitable partnerships, safeguarding (do no harm), good financial grants practice, open access, research management, ethics and gender.

- **Develop a joined-up, longer-term vision and approach** to maximise the value of investments and for the sustainability and impact of UK RCS investments, particularly in an uncertain funding climate where every investment counts. Strengthening individual, institutional and research systems capacity is a long-term endeavour and long-term investment is needed (10-20 years). There are constraints such as the length of UK funding cycles which mean RCS programmes are often short-term (two to four year) investments. Potential ways to ensure longevity and impact could include:

    1. Integration between UK funders e.g. looking at what has already been funded before launching calls and programmes.

    2. Further resources allocated to enhance visibility of investments and data capture across funders on RCS programmes including on recipients, alumni, and financial breakdowns to support future strategies and approaches with LMIC partners, building on existing systems if possible.

    3. Leveraging previous investments e.g. building on existing initiatives rather than start from scratch and working together and with partner countries and institutions to pick up successful programmes if they come to an end.

However, this should not be at a cost to innovative new activities where there are national and regional needs and demands. Building sustainability into programmes and knowing when and how to end is also important. In addition, with current uncertainty and a reduced UK ODA budget, prioritisation of RCS and impact of funding becomes even more important.

- **Continue to ensure research capacity strengthening investments are demand-led and move to in-country led models,** looking at learning from successful initiatives such as AESA and the Newton Fund. This could involve working with governments and research funders in LMICs to jointly fund RCS programmes. In some cases, there could be opportunity to mobilise additional domestic resources for greater impact and equitable partnerships, for example the India Alliance is a long-term funding partnership between the Government of India and Wellcome, for which in the second phase the Government of India has doubled the ratio of its investment. Further sharing of successes in and models for leveraging national contributions would be useful. In the context of country-ownership of investments, greater openness to understanding what constitutes good quality research in LMICs is also important.

- **Explore opportunities for joined-up country and institutional support.** For example, analysis of institutions that receive multiple programmatic support from UK funders could help identify opportunities for coordinated and impactful support, and opportunities for institutions to better coordinate the support they receive. UK in-country funding offices and hubs could also play a role to support synergies in-country such as linking up programmes and coordinating post-award support.

- **Look into potential models to support and consolidate support to countries and institutions with lower research capacity** where there is demand and higher urgency of need and there is currently less UK support. This could involve further work to understand demand and what RCS approaches work in low-income settings. A recent ESSENCE on Health Research Initiative study[24] for example found that health research systems of countries with low research capacity shared similar gaps including the absence of sustainable local career pathways, platforms for engagement between researchers, policy makers and implementers and a poor enabling infrastructure for research. A needs assessment of R&D systems in seven countries in East and West Africa also highlighted an incomplete and under-resourced national institutional framework [25]. Leveraging expertise from countries that have strengthened their national R&D systems, to foster south-south partnerships could be one approach, for example through consortia models.

24 Common RCS gaps found in Nigeria, Sierra Leone, Democratic Republic of Congo, Lao (PDR), Nepal, Guatemala, Haiti, and Moldova. Eigbike, M (2020) Health research capacity strengthening in low and middle-income countries: current situation and opportunities to leverage data for better coordination and greater impact

25 Fosci, M. et al. (2020) Strengthening Research Institutions in Africa: Seven Country Needs Assessments

- **Look to expand research capacity strengthening in other sectors beyond health** such as agriculture, climate change and social sciences, in relation to national and regional priorities and needs and that also support the UK Government's priorities in aid on seven global challenges [26]. Utilising learning and expertise in health RCS and understanding the transferability of approaches is also important.

- **Build the evidence base on what works in research capacity strengthening** through effective research and monitoring and evaluation so decisions and approaches in RCS are based on evidence. Previous and recent reviews have highlighted a lack of strong evidence on what works in RCS and poor-quality monitoring and evaluation (M&E) and empirical research on the topic[27] ; and a clear understanding of the problems to address, but limited evidence on the effectiveness of interventions and what types of investments are worthwhile investing in[28]. RCS programmes also need to be researched and evaluated for a longer period than the programmes themselves. However, there have been recent effort to enhance the evidence base which could be built upon including work to develop indicators and good evaluation practice in RCS[29].

26 UK aid is focused on seven global challenges where the UK can make the most difference. These are: Climate Change and biodiversity, COVID and global health security, Girls' education, Science, research, technology, Open societies and conflict resolution, Humanitarian preparedness and response, and Trade and economic development.

27 Franzen SRP, Chandler C, Lang T. Health research capacity development in low- and middle-income countries: reality or rhetoric? A systematic meta-narrative review of the qualitative literature. BMJ Open 2017;7:e012332. doi: 10.1136/bmjopen-2016-012332

28 Fosci, M., Loffreda, L., Velten, L., Johnson, R. (2019) Research Capacity Strengthening in Low- and Middle-Income Countries.

29 Anne M. Khisa , Evelyn Gitau , Justin Pulford and Imelda Bates (2019) A Framework and Indicators to Improve Research Capacity Strengthening Evaluation Practice.

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ABOUT UKCDR

UK Collaborative on Development Research (UKCDR) is a collaborative of government and research funders working in international development. Our core contributing members include the Department for Business, Energy and Industrial Strategy (BEIS); the Foreign, Commonwealth and Development Office (FCDO); the Department of Health and Social Care (DHSC); UK Research and Innovation (UKRI); and Wellcome. UKCDR exists to amplify the value and impact of research for global development by promoting coherence, collaboration and joint action among UK research funders.

For further information on UKCDR, please visit ukcdr.org.uk.

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British Academy	FCDO*	UKRI-MRC*	UKRI*
British Council	Innovate UK	Royal Academy of Engineering	Wellcome*

* Funder was also a member of the project Steering Group

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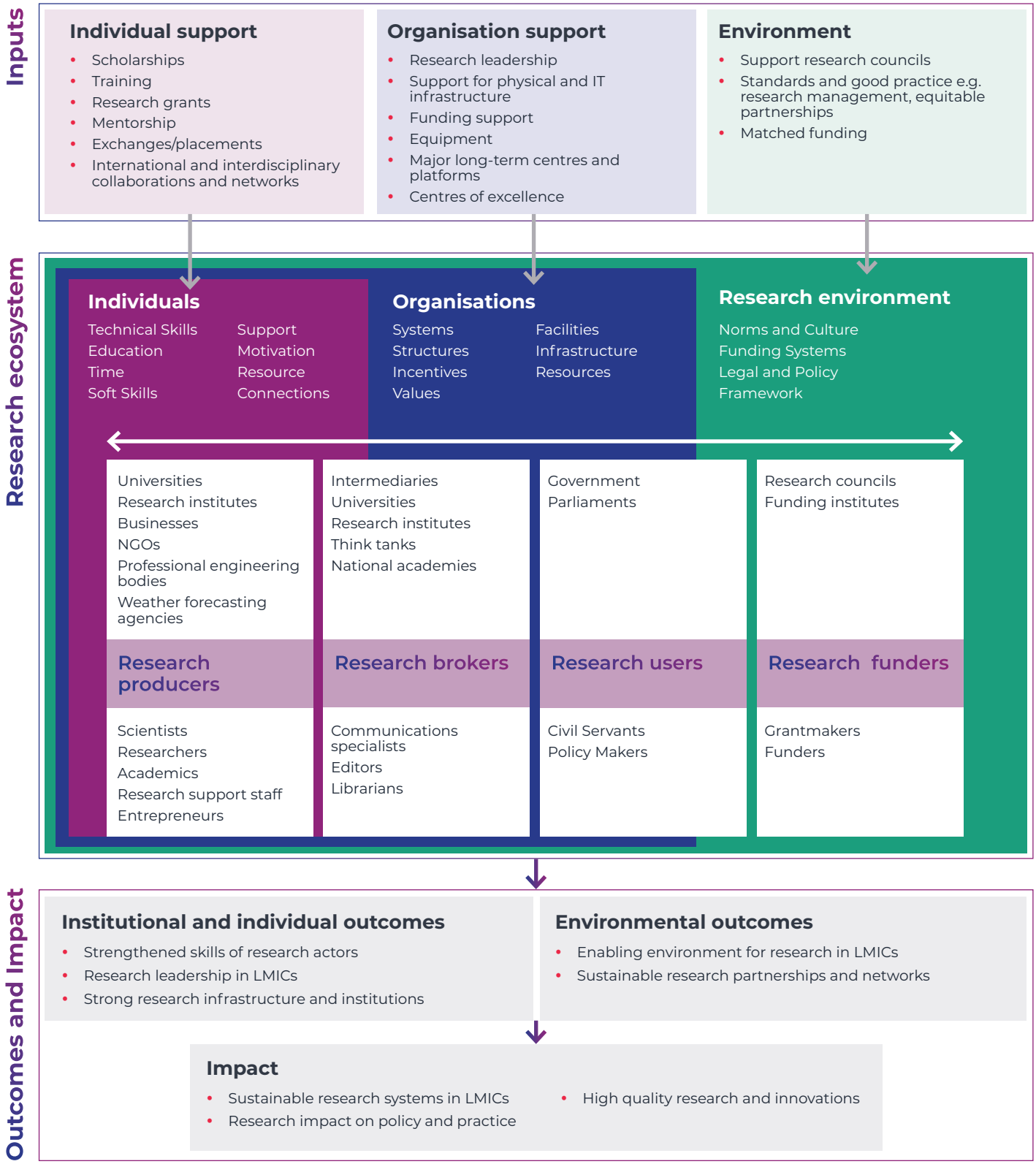
30 UKCDR Research Capacity Strengthening Group https://www.ukcdr.org.uk/what-we-do/our-funder-groups/research-capacity-strengthening-group/

ANNEX 1: KEY AREAS OF UK-FUNDED RESEARCH CAPACITY STRENGTHENING SUPPORT

The UK supports a diverse range of areas to strengthen research capacity in LMICs. RCS support by UK funders happens across the research system to strengthen production, communication, use and funding of research. Figure 7 outlines a framework for research capacity strengthening in LMICs with key areas of donor support and outcomes aimed for. The framework has been adapted from a previous DFID (now FCDO) 'national research sector framework' and encapsulates common outcomes and stakeholders from UK funds provided by funders in UKCDR's mapping.

Figure 7: Framework for research capacity strengthening in LMICs



Key areas and examples of programmes supported by the UK in research capacity strengthening across different levels (individual institutional, environmental/systems) are outlined below.

Individual level

Building a critical mass of researchers	Developing a critical mass of quality researchers in LMICs is important to address challenges at scale. The UK has a long history of training individual researchers through fellowships and scholarships in the UK or in LMICs. As highlighted in a previous UKCDR study[31] the UK invested over £191m in 5,633 African fellows and scholars over 2014-19 across Master's, PhD, postdoctoral and early-mid career levels through flagship programmes such as Chevening Scholarships, Commonwealth Scholarships and Newton International and Advanced fellowships.
Developing research excellence through international collaboration	A common model used by the UK for strengthening research capacity is through international research collaborations and embedding RCS activities while conducting major research. For example, the GCRF Growing Research Capability programme led by UKRI which has facilitated 37 projects to strengthen interdisciplinary skills and expertise in 11 global challenge areas, useing a wide range of RCS approaches including Massive Open Online Courses (MOOCs) and institutional level support such as the launch of a new Health Economics and Policy Unit in Malawi through the Thanzi La Onse programme.
Delivering high quality training	UK funders aim to provide high quality training to research actors, for example: • 53 National Institute for Health Research (NIHR) Global Health Research Units and Groups funding (through DHSC) for over 150 trainees from LMICs who are receiving a package of tailored training coordinated through the NIHR Academy. • Through BEIS and GCRF, the UKRI-BBSRC (Biotechnology and Biological Sciences Research Council) is funding the Strategic Training Awards for Research Skills (GCRF-STARS) programme. Skills schools and e-learning platforms are being used to develop a self-sustaining network of bioinformaticians in Africa with expertise in data analysis for agricultural biosciences and provide specialist training in biorefineryenzymes in South East Asia.
Mentoring	Mentoring approaches are a key part of FCDO-funded programmes, Partnership for Economic Policy (PEP) and Climate Impacts Research Capacity and Leadership Enhancement (CIRCLE), to enhance skills in economics policy and climate change research. CIRCLE uses a model whereby each fellow is supported by three research experts: a mentor at their home institution, a supervisor at their host institution and a specialist advisor at a third institution.
Fostering innovation capacities	BEIS and FCDO are funding various programmes through Innovate UK such as the Energy Catalyst and the GCRF AgriFood Africa Programme which implements an accelerator programme to help businesses scale up their business as well as their technology. Their Urban Links Africa programme is also running capacity building workshops to support African cities in becoming innovation ready.
Strengthening capacity of decision-makers to use evidence	FCDO have led new work to strengthen the abilities of policymakers in LMICs to use evidence and research. The £15.7 million BCURE programme (2013-17) aimed to improve the use of evidence in decision making in 12 countries in Africa and Asia. An evaluation[32] found several examples of improved evidence use for example in Bangladesh and Sierra Leone (cross-government) and Kenya (Parliament).

31 Kunaratnam, Y., Waage, J., Bucher. A, Boyd, C. (2020) A Mapping & Analysis of UK-funded Fellowships & Scholarships for Africa.
32 Vogel and Punton (2018) Executive Summary: Final Evaluation of the Building Capacity to Use Research Evidence (BCURE) Programme

Institutional level

Major long-term centres and platforms	The UK has made significant long-term core funding investments through the MRC Unit The Gambia at London School of Hygiene & Tropical Medicine (LSHTM) and MRC/Uganda Virus Research Institute (UVRI) and LSHTM Uganda Research Unit established in 1947 and 1988 respectively, and Africa and Asia programmes (AAPs) in Kenya, South Africa, Malawi, Thailand, Vietnam supported by Wellcome for over 30 years. Wellcome's AAPs have provided game changing support in biomedical sciences, training and supporting the next generation of researchers and research leaders in their regions. The MRC Unit The Gambia at LSHTM is the UK's single largest investment in medical research in an LMIC.
Enhancing southern research leadership	UK funders are playing a key role in enhancing research leadership at the individual and institutional level: • the Developing Excellence in Leadership, Training and Science (DELTAS) is a capacity building programme developing research leaders in biomedical and population health research, co-funded by Wellcome and FCDO, supporting 11 African led research consortia with a focus on scientific quality, research training and scientific citizenship. • The FCDO-MRC African Research Leader Scheme aims to strengthen research leadership across sub-Saharan Africa (SSA) by attracting and retaining exceptionally talented individuals who will lead high quality research programmes on key global health issues pertinent to SSA. Each African Research Leader is supported by a UK based mentor, offered career development activities, training or skills development (e.g. research management, mentoring, publication writing, industry internship) and offered institutional development grants for their institutions.
Centres of excellence	BEIS through UKRI are funding capacity building and collaborative research grants for 13 African Research Universities Alliance (ARUA) interdisciplinary centres of excellence in thematic priorities in Africa, to promote African led research.
Strengthening research instituions	There are several UK-funded programmes focused at the institutional level, including: • The Newton Fund African Science for Weather Information and Forecasting Techniques led by the Met Office and National Centre for Atmospheric Science, which aims to build capacity within African weather forecasting agencies. • FCDO's Strengthening Research Institutions in Africa (SRIA) programme which aims to strengthen research institutions and systems in seven countries in East and West Africa.
Strengthening clinical trial capacity	Launched in 2010, the UKRI-MRC and Wellcome led Joint Global health trials (JGHT) scheme provides funding for randomised control trials (RCTs), innovative trial methodologies and adaptive designs in global health. It is jointly funded by BEIS via UKRI-MRC, FCDO, DHSC/NIHR and Wellcome. 82 trials have been funded and 67 trial development grants awarded to date. Although primarily a clinical research programme, a major outcome of the scheme has been strengthened site capacities to conduct future definitive trials[33].
Strengthening southern funder capacity	Strengthening southern research funding processes and institutions is a an area of work by UK funders to strengthen broader research systems in LMICs. Wellcome, Bill & Melinda Gates Foundation, and FCDO support to establish the Alliance for Accelerating Excellence in Science in Africa (AESA) - a funding platform established as an initiative of the AAS and the African Union Development Agency (formerly NEPAD) to manage grants – has provided support for leadership for scientific research in Africa and delivery for science, technology, and innovation programmes including DELTAS. This model ensures agenda setting and funding decisions are led from within Africa. In addition, the Science Granting Council's Initiative (SGCI) co-funded by FCDO and international funders aims to strengthen the effectiveness of government investments in research in Africa. The Newton Fund partnership model also strengthens southern funder capacity.

33 Varnai, P., Rentel, M., Davé, A., Simpson, K., Tiriduzzi, C., Pottinger, E. (2019) Review of the Joint Global Health Trials funding scheme - Final Report

Environmental/systems level

Raising research management standards and practice	There is greater recognition that specialist research management expertise is required to support LMIC researchers (whose time is often taken up with teaching responsibilities) in the business and delivery of high-quality research. ReMPro Africa (Research Management Programme in Africa) is an ambitious programme to build sustainable capacity in research management in African institutions, led by AAS. Wellcome has funded two posts at the AAS and has worked with the AAS to attract additional funders (including FCDO, DHSC, UKRI and Royal Society), a good example of UK coherence. The programme is focused on the four interconnected strands: institutional leadership, sustainability, common standards and good practice in research management for professionalisation in the sector and developing individual capacity of research management staff. There is a similar programme in India, the India Research Management Initiative (IRMI), managed through the India Alliance to strengthen institutional research management systems.
Mobilising domestic research invetsment	There is evidence of underinvestment in research by many LMIC governments. Although there are commitments to increase this, expenditure on R&D remains less than 0.5% of gross domestic product[34]. Wellcome is funding the Coalition for Research and Innovation (CARI), alongside the Bill and Melinda Gates Foundation, the National Institutes of Health and AESA to ensure research investment within Africa in the long-term. Led by AAS it aims to catalyse greater local investment and encourage African nations to scale up resources for science, technology and innovation through a coordinated platform and strategic advocacy. The Newton Fund model also mobilises domestic research investment on topics of national interest through matched funding.
Fostering equitable partnerships	This area of funder action comes from the need to promote a 'level playing field' for southern LMIC researchers and avoid 'extractive' research partnerships with power significantly skewed to the northern partner. In 2016 UKCDR conducted a review of research partnerships setting out principles for research funders[35]. These principles, and other similar international initiatives [e.g. Swiss Commission for Research Partnerships with Developing Countries (KFPE), Research Fairness Initiative (RFI)] aim to ensure through research grant and contract conditions, fair partnership principles including, ensuring transparency of the overall research budget, allowing southern partners institutional overhead costs to be funded, and agreeing fair distribution of authorship. Further work on funder principles and good practice by UKCDR and ESSENCE aims to help to shift the balance to more equitable and long-term partnerships.
Promoting good financial grant practice	Promoting common assurance approaches can help to significantly reduce grant transaction costs for partners and institutions in the global south. Several UK funders have invested in the Good Financial Grant Practice (GFGP), an initiative to enable research institutions in low resourced settings to undertake their own due diligence against a commonly adopted International Standard which is assessed as Bronze, Silver, Gold or Platinum and audited and checked independently for other funders to access.

34 Fosci et al. (2019) Research Capacity Strengthening in LMICs
35 Dodson, J. (2017) Finding and building effective and equitable research collaborations or partnerships.

ANNEX 2: PRIMARY LEVEL OF UK-FUNDED RESEARCH CAPACITY STRENGTHENING PROGRAMMES

The tables below show the primary level of UK-funded research capacity strengthening programmes aimed at strengthening. Some programmes were indicated by funders as having two primary levels and feature in different levels.

Table A1: Primary level of research capacity strengthening support by funder (standalone)

	Individual	Institution	Environment/Systems
BEIS	• African Economic Research Consortium (AERC) • African Research Excellence Fund • Development in Africa with Radio Astronomy (DARA) • DFID-MRC African Research Leader Scheme • Future Leaders - African Independent Research (FLAIR) Fellowships • GCRF-STARS (Strategic Training Awards for Results Skills) programme • Global Innovation Policy Accelerator (GIPA) • Institutional Skills Development • Leaders in Innovation Fellowships • MRC Global Health RCS strategy • Newton Advanced Fellowships – Academies • Newton International Fellowships • Newton PhD programme • Professional Development and Engagement Programme (PDE) • RCUK-NRF International PhD Partnering Scheme Call • Researcher Links (travel grants and workshop grants) • Staff exchange programme • Tackling global development challenges through mathematical sciences	• Global Innovation Policy Accelerator (GIPA) • Institutional Skills Development • MRC Global Health RCS strategy • MRC Unit The Gambia at LSHTM • MRC/UVRI and LSHTM Uganda Research Unit • Professional Development and Engagement Programme (PDE) • ReMPro Africa (Research Management Programme in Africa) • Research Environment Links • Researcher Links (travel grants and workshop grants) • Tackling global development challenges through mathematical sciences	• Global Innovation Policy Accelerator (GIPA) • Global Research Council (GRC) • Good Financial Grant Practice (GFGP) • MRC Global Health RCS strategy • Professional Development and Engagement Programme (PDE) • Research Capacity Strengthening Group • Research Environment Links • Tackling global development challenges through mathematical sciences • UKCDR Equitable partnerships • UKCDR Safeguarding
DHSC	• Fleming Fellowship Scheme • Fleming ODI Fellowships • International fellowships: Masters, Intermediate, Training (3 schemes) • NIHR Global Health Research Training Programme • NIHR Global Research Professorships • NIHR-Wellcome Global Health Research Partnership • RSTMH Small Grants Programme • Structured Operational Research and Training Initiative (SORT IT) on building sustainable operational research capacity on antimicrobial resistance (AMR) in low-and-middle-income countries	• Financial Assurance Fund (FAF) • NIHR Global Health Research Centres • Research Management Programme in Africa (ReMPro Africa)	• Good Financial Grant Practice (GFGP) • Research Capacity Strengthening Group • UKCDR Equitable partnerships • UKCDR Safeguarding

	Individual	Institution	Environment/Systems
FCDO	• African Economic Research Consortium (AERC) • Chevening Scholarships • Climate Impacts Research Capacity and Leadership Enhancement (CIRCLE) • Commonwealth Scholarships • Developing Operational Research Capacity in the Health Sector • DFID-MRC African Research Leader Scheme • Queen Elizabeth Commonwealth Scholarships (QECS) • Strengthening Evidence Use for Development Impact • Structured Operational Research and Training Initiative (SORT IT) on building sustainable operational research capacity on antimicrobial resistance (AMR) in low-and-middle-income countries	• Africa Capacity Building Initiative (ACBI) • Developing Excellence in Leadership Training and Science (DELTAS) • Development Research Uptake in Sub Saharan Africa (DRUSSA) • MRC Unit The Gambia at LSHTM • MRC/UVRI and LSHTM Uganda Research Unit • Partnership for African Social and Governance Research (PASGR) • ReMPro Africa (Research Management Programme in Africa) • Strategic Partnerships for Higher Education Innovation and Reform (SPHEIR) • Strengthening Research Institutions in Africa • Think Tank Initiative	• Alliance for Accelerating Excellence in Science in Africa (AESA) • Building Capacity to Use Research Evidence • Geo-Referenced Infrastructure and Demographic Data for Development (GRID3) • Global Partnership for Sustainable Development Data • Monitoring the Sustainable Development Goals • Research Capacity Strengthening Group • Science Granting Council's Initiative (SGCI) • Statistics for Results Facility • Strategic Partnership with UK Office for National Statistics • Strengthening Research Institutions in Africa • Strengthening Research Knowledge Systems (SRKS) • UKCDR Equitable partnerships • UKCDR Safeguarding
Wellcome	• India Alliance • International fellowships • Mobility Schemes • NIHR-Wellcome Global Health Research Partnership	• Developing Excellence in Leadership Training and Science (DELTAS) • Research Management Programme in Africa (ReMPro Africa)	• Alliance for Accelerating Excellence in Science in Africa (AESA) • Building the case for investment in health sciences research in Africa • Coalition for African Research and Innovation (CARI) • INGSA (International Network for Government Science Advice) • International Vaccines Task Force (IVTF) • Research Capacity Strengthening Group • Strengthening health science research in Africa – a regional analysis • UKCDR Equitable partnerships • UKCDR Safeguarding

Table A2: Primary level of research capacity strengthening support by funder (embedded)

	Individual	Institution	Environment/Systems
BEIS	• Africa Prize for Engineering Innovation • Agri- Tech Catalyst- Supporting Agricultural Innovation for International Development • Applied Global Health Research Board • Applied Research for Adolescent Health in LMICs • Energy Catalyst • European Developing Countries Clinical Trials Partnership (EDCTP) • GCRF AgriFood Africa Programme • GCRF Challenge-led Grants • GCRF Digital Innovation for Development in Africa (DIDA) • GCRF Fellowships - Springboard Awards • GCRF Global Health Policy Workshops • GCRF Global Multimorbidity • GCRF Grow Capability Programme • GCRF Networking Grants • Global Alliance Africa • Global Alliance for Chronic Diseases (GACD) • Global Engagement Networks • Global interdisciplinary research hubs • Global Maternal and Neonatal Health • Global Research Programme; addressing the health needs of women and children in disadvantaged populations globally - GRP2 • Health Systems Research Initiative (HSRI) • International Collaboration Awards • Joint Global Health Trials • Joint Global Research Programme: Women's and children's health - GRP1 • MRC-AHRC Global Public Health: Partnership Awards • Newton Fund - Met Office Weather and Climate Science for Service Partnership Programme (WCSSP) • Research Chairs • South Africa - UK Antibiotic Accelerator • UK-Brazil Joint Centre Partnerships • Urban Links Africa	• Agri-Tech Catalyst • Energy Catalyst • GCRF Africa Catalyst • GCRF Partnership Programme for Capacity Building • Global Alliance Africa • Higher Education Partnerships in sub-Saharan Africa • Industry-Academic Partnerships • Institutional Links • Newton Fund Impact Scheme • Newton Fund - Met Office Weather and Climate Science for Service Partnership Programme (WCSSP) • Research Chairs • Transforming Systems through Partnership • Urban Links Africa	• Equitable partnerships • European Developing Countries Clinical Trials Partnership (EDCTP) • GCRF Global Health Policy Workshops • Industry-Academic Partnerships • Newton Fund Impact Scheme • Newton Fund - Met Office Weather and Climate Science for Service Partnership Programme (WCSSP)

	Individual	Institution	Environment/Systems
DHSC	• Applied Global Health Research Board • Applied Research for Adolescent Health in LMICs • European Developing Countries Clinical Trials Partnership (EDCTP) • Global Alliance for Chronic Diseases (GACD) • Global Maternal and Neonatal Health • Joint Global Health Trials • NIHR Global Health Research Units and Groups • NIHR RIGHT (Research and Innovation for Global Health Transformation)	• NIHR RIGHT (Research and Innovation for Global Health Transformation)	• Fleming Global awareness and use of data to change policy and practice • Fleming Online learning • Fleming Regional Grants
FCDO	• Agri-Tech Catalyst • Applied Global Health Research Board • CPE Seed Fund • Energy Catalyst • European Developing Countries Clinical Trials Partnership (EDCTP) • GCRF AgriFood Africa Programme • Global Research Programme GRP2 • Health Systems Research Initiative (HSRI) • Joint Global Health Trials • Joint Global Research Programme: Women's and children's health - GRP1 • Partnership for Economic Policy (PEP) • Support for research into tropical diseases, human reproduction and health policy and systems through WHO-based research programmes	• Agri-tech catalyst • Energy Catalyst • Research Programme Consortia (RPCs) • Support for research into tropical diseases, human reproduction and health policy and systems through WHO-based research programmes	• Climate and Resilience Framework Programme (CLARE) • European Developing Countries Clinical Trials Partnership (EDCTP) • Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises (SPARC) • Weather and Climate Information Services for Africa (WISER)
Wellcome	• CPE Seed Fund • GCRF Fellowships - Springboard Awards • Joint Global Health Trials	• Africa Asia Programmes (Kenya) • Africa Asia Programmes (Malawi) • Africa Asia Programmes (South Africa) • Africa Asia Programmes (Thailand) • Africa Asia Programmes (Vietnam) • Africa Institutes Initiative (AII) • CIDRI-Africa • Wellcome Centres for Global Health Research	

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ANNEX 4: METHODOLOGY

Data collection for landscape report

The data used for this component were collected from the three UK government departments with the largest ODA budget allocations, collectively accounting from more than 95% of the total ODA research budget (namely BEIS, DHSC and FCDO) and Wellcome (table A3). Data from BEIS' delivery partners (who manage programmes funded under GCRF and the Newton Fund on behalf of BEIS) were collected centrally through the department.

Table A3: List of Funders with Data Included in Landscape Report of Research Capacity Strengthening Programmes in Low- and Middle-Income Countries

Funder
Department for Business, Energy and Industrial Strategy (BEIS)* Delivery partners • *Academy of Medical Sciences* • *British Academy* • *British Council* • *Innovate UK* • *Met Office* • *Royal Academy of Engineering* • *Royal Society* • *UK Research and Innovation*
Department for Health and Social Care (DHSC)*
Foreign, Commonwealth and Development Office (FCDO)*
Wellcome

* Indicates data obtained from ODA-funded research programmes

Inclusion criteria

To be included in the landscape report, programmes were required to meet the following criteria:

- Any research capacity strengthening (RCS) programme funded by a UKCDR member organisation that was active at any point during the five-year period between FY 2016/17 and 2020/21.
  - This may include any RCS programme led by an international funder that is co-funded by a UKCDR member organisation[36].
- Funded using ODA.
  - This requirement does not apply to Wellcome who were instead requested to provide data on RCS programmes that are relevant to international development.

For this analysis, RCS programmes are defined as those programmes that are aimed at "enhancing the ability and resources of individuals, institutions and/or systems to undertake, communicate and/or use high quality research efficiently, effectively and sustainably". To be considered for this analysis, RCS programmes could either be in the form of dedicated programmes where RCS is the primary/sole purpose (defined as 'standalone' programmes) or embedded as part of a wider research programme ('embedded' programmes). Only embedded programmes with a significant (rather than incidental) focus on RCS were considered for this analysis.

Data Request, Validation, and Data Fields

As part of the data request, each funder received spreadsheets (based on each existing information completed by UKCDR) containing the details of the RCS programmes under that funder's portfolio that met the inclusion criteria noted above. Funders were requested to validate the data in the spreadsheet by confirming the provided details of the funded RCS programmes, supply missing details from any of the RCS programmes (including financial information and beneficiary countries and institutions), and supply the details of all other RCS programmes not already included.

36 While it is acknowledged that there are other significant non-UK investors in RCS in LMICs, including multilateral, national and philanthropic agencies, the scope of the analysis focuses on UK funding.

UKCDR requested funders to validate and/or provide detail on the following key data fields for the analysis:

Table A4: Data fields used for landscape analysis of UK-funded research capacity strengthening programmes

Data field	Description
Benefitting countries	A list of all ODA-eligible countries identified as primarily benefiting from the RCS programme and/or location where funded activity takes place. If funders were unable to provide data on specific countries benefitting from an RCS programme, funders were instead requested to complete the 'Benefitting Regions' data field. ODA-eligible countries defined using the OECD DAC List of ODA Recipients.
Benefitting LMIC institutions (if available)	LMIC-based institutions benefitting from RCS support. If funders were unable to provide data on specific institutions benefitting from an RCS programme, funders were instead requested to indicate a numeric range of benefitting institutions.
Benefitting regions	A list of geographic regions identified as primarily benefiting from the RCS programme and/or location where funded activity takes place. The geographic regions used for this analysis are the same as those defined by United Nations Statistics Division.
Co-funders	The name(s) of any organisation providing co-funding for a given RCS programme.
Description of RCS programme	Description of RCS or RCS-related programme including objectives, envisaged outcomes, and approaches.
Fund name	The name of associated fund or funding for a given RCS programme (e.g. DHSC Global Health Research, GCRF, Newton Fund).
Lead funders	The name of the lead organisation(s) providing the funding for a given RCS programme.
Primary and secondary levels of RCS support	Whether the main area(s) of RCS support are at the individual, institutional or environment/systems level: • **Individual:** The development of researchers and teams via for example, training, fellowships and scholarships. • **Institutional:** Supporting research capacity of universities, institutes, and think-tanks to fund, manage and sustain their own research through research management, leadership, communications, incentives, or infrastructure of organisations. • **Environmental/systems:** Improving structures and the political and regulatory context under which research is undertaken and used, as well as ensuring research grants embed best practice principles e.g. equitable partnerships.
RCS approaches	Key RCS approaches used (e.g. equitable partnerships, fellowships, investing directly in southern institutions, N-S collaboration, workshops).

Data field	Description
RCS focus	Main area of RCS support (e.g. commercialisation, entrepreneurship, grant management, innovation, M&E, research funding, research access, research communications/ uptake, research environment, research governance, research leadership, research management, research production, research proposals, research systems, research/policy translation, use/demand for research).
RCS programme	Name of the RCS programme.
Spend During FY 16/17, 18/19, 19/20, 20/21	Total expenditure (in GBP) by funder on RCS programme for individual financial years between 2016/17 and 2020/21.
Start / End Date	Start and end date of programme.
Status	Status of programme - either **Active** or **Ended**.
Theme	The subject area of the research that comprises a significant amount of the programme's focus. These can include funder-specific sets of thematic areas, Sustainable Development Goals (SDGs), etc.
Type of RCS programme	Indicates whether the RCS programme is either a **Standalone** or **Embedded** programme.

Data analysis

A variety of summary statistics and data visualisations were used to present the information outlined in Table A4 across multiple and individual funders. It should be noted that, while many individual projects may be funded under a given RCS programme, this landscape report only provides an analysis at the overall programme level.

Grouping funder responses

In selected instances where the data request resulted in funders providing many different individual values for qualitative data fields (RCS approaches and RCS focus), similar responses were grouped together into a single category and then summarised for the analysis.

As indicated in Table A4, funders were asked to indicate the thematic area(s) of individual RCS programmes, where available (drawing from a pre-defined set of thematic areas, such as the SDGs, or from their own internal categorisation process). To enhance the comparability of this data, for those programmes where SDGs were not provided, the thematic areas were translated into as many of the SDGs as were relevant based on the responses received. However, it should be noted that, for this analysis, only 14 of the 17 SDGs were considered for inclusion.

The three SDGs not selected to classify programmes against were SDG 1: No Poverty, SDG 10: Reduced Inequality and SDG 17: Partnership for the Goals as each of these goals is deeply embedded within the funding programmes strategies of funders. This is particularly apparent with SDG 10 and SDG 17 where ODA is referenced multiple times within each goal's respective targets and indicators as a tool to achieve the SDGs. In the case of SDG 1, this goal is focused on the eradication of poverty in all its forms everywhere – which is at the core of each funder's research programme.

Data limitations and challenges

There are some key considerations regarding the analysis of the data for this report:

- **Comprehensiveness of all UK RCS programmes:** While every attempt has been made to provide as complete an overview of UK-funded RCS activities in LMICs as possible, the 133 programmes included in this analysis should not be considered an exhaustive list of every single UK ODA and Wellcome-funded RCS activity between FY 2016/17 and FY 2020/21. This is because the mapping aimed to draw on existing information which may not have been comprehensive and differences may have occurred between funders in the interpretation of the inclusion criteria – particularly for those programmes whose activities did not fit within the supplied definitions in the most obvious way. This may have subsequently resulted in some programmes being considered out of the scope of (and therefore missing from) this mapping exercise.

- **Data completeness:** The validated data had varying levels of completeness as not all funders could provide information on all of the data fields indicated in Table A4. Therefore, all figures and charts presented in the analysis indicate the level of completeness by specifying the number of programmes for which data could be obtained. Therefore, statistics presented in the analysis in relation to the data fields outlined in Table A4 should therefore be interpreted as the minimum amount for those fields.
    - On a related point, due to differences in definitions of how programme spend is calculated, data on spend could not be obtained from FCDO via data request for one of their longstanding programmes – namely the Chevening Scholarships (which has supported professionals to study in the UK since 1983). Instead, UKCDR were advised by FCDO to obtain spend data for this programme using publicly available information online. However, spend data on the Chevening Scholarships was only available for the four-year period between FY 2017/18 and 20/21. As a result, an estimate was calculated for FY 2016/17 using the average annual spend between FY 2017/18 and 20/21.

- **Data granularity:** For the data fields on benefitting countries and benefitting LMIC institutions, the validated data had varying levels of granularity with some funders only being able to provide a numerical range of either. This resulted in some of the analysis lacking individual country and/or institutional data. Therefore, all figures and charts presented in the analysis using data on either benefitting countries or LMIC institutions specify the number of programmes for which data individual countries or institutions could be obtained. Furthermore, with data on benefitting countries and LMIC institutions being aggregated and collected at the programme level, most programmes considered in this analysis list multiple countries and/or institutions without detailing how the other data fields (e.g. financial information, approaches used, thematic areas, etc.) were divided between them. This means that analyses at the level of individual countries or institutions can only be carried out to a limited extent and largely without providing additional analyses against other collected data fields.

- **Financial information:**
    - *In-country expenditure:* This analysis did not request funders to provide data on in-country expenditure as this information is not presently collected systematically across UK research funders. Though the establishment of methods to collect data systematically on in-country expenditure of ODA-funded research projects remains part of UKCDR's overall commitment to improve data processes across funders, systems do not presently allow for the examination of such data to be included in this analysis. In this respect, the spend amounts do not reflect funds that the UK sends to ODA-eligible countries in development assistance. Rather, it reflects overall expenditure on RCS programmes that benefit ODA-eligible countries.

    - *Spend on embedded RCS programmes:* From the way that data is presently collected by UK funders, it is not possible to isolate how much of an embedded RCS programme's overall expenditure is specifically devoted to RCS activities. Therefore, spend amounts for embedded RCS programmes are a reflection of how much the UK funders spend on research programmes that include a significant RCS component, rather than how much is spent on RCS activities specifically. These figures are reported separately to spend amounts for standalone RCS programmes.

- **Lack of RCS classification systems:** Unlike in a variety of sectors, RCS as a field currently lacks an established classification system and/or typology against which different types of programmes, approaches used, areas of support, etc. can be categorised consistently. When collecting data on the 'RCS Approaches' and 'RCS Focus' data fields (Table A4), funders were given the option to draw from a list of examples provided and created by UKCDR or supply their own responses. The submitted data for both fields were then individually assessed by UKCDR and grouped into a single category, where appropriate (as mentioned above).

Assessing national research and development systems

In the main report, Figure 6 provides an overview of the different countries benefitting from UK-funded RCS support according to a global ranking of national research and development systems by the World Economic Forum (WEF) as part of their annual Global Competitiveness Report. The assessment of a country's R&D system is a composite index calculated by the WEF that takes into account scientific publications, patent applications, R&D expenditure, and research institutions prominence. This analysis uses the 2019 edition of the Global Competitiveness Report[37] - the most recent version that contains a global ranking of national R&D systems.

It should be noted that the ranking produced by the WEF does not include every single country in the world – including several of the countries listed as benefitting from UK-funded RCS as part of this analysis. As a result, Figure 6 includes a note indicating the number of countries for which a national ranking could not be obtained.

37 Schwab, K. (2019) The Global Competitiveness Report 2019. World Economic Forum.

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