

Global Challenges Research Fund: Stage 1b Fund-wide Survey Report

Date: 4 April 2024

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Submitted by Itad



Acknowledgements

The evaluation team would like to thank the Department for Business, Energy and Industrial Strategy (BEIS) staff who have guided, informed and supported Stage 1b of the GCRF evaluation. We would also like to thank GCRF's partner organisations for sharing their time and valuable insights. We would also like to thank all the module teams, for conducting the insightful Stage 1b assessments, and our partners – Itad, RAND Europe, AFIDEP, Athena Infonomics, NIRAS-LTS and Digital Science – for their collaboration.

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Suggested citation

Itad. 2023. Global Challenges Research Fund: Stage 1b Fund-wide Survey Report. Brighton.

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Acronyms

AMS	Academy of Medical Sciences
BA	British Academy
BEIS	Department for Business, Energy & Industrial Strategy
Co-I	Co-Investigator
EQ	Evaluation Question
EWG	Evaluation Working Group
GCRF	Global Challenges Research Fund
GESIP	Gender Equality, Social Inclusion and Poverty
HEFB	Higher Education Funding Body
HEI	Higher Education Institution
HIC	High-Income Country
LIC	Low-Income Country
LMIC	Low- and Middle-Income Country
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
MEQ	Main Evaluation Question
MIC	Middle-Income Country
NGO	Non-Governmental Organisation
ODA	Official Development Assistance
PO	Partner Organisation
PI	Principal Investigator
pp	Percentage Point(s)
R&I	Research and Innovation
RAE	Royal Academy of Engineering
RS	Royal Society
ToC	Theory of Change
UKRI	UK Research and Innovation
UKSA	UK Space Agency

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Executive Summary

How can management structures and implementation processes promote research impact?

In scientific research and innovation (R&I), management structures, implementation processes and pre-research context analysis can sometimes be portrayed as additional bureaucracy that impedes the research endeavour. However, the findings from a large-scale survey of the Global Challenges Research Fund (GCRF) award holders highlight how certain key management structures and implementation processes are associated with greater probabilities of reporting outputs and outcomes, precursors of impact. This annex presents key results and analysis from a survey of all the award holders in GCRF, carried out in 2021-22, with supporting evidence from a survey of GCRF partner organisations (POs).

Implemented between October 2021 and February 2022, the fund-wide survey aimed to capture how GCRF investments have been working (process) and what has been achieved (effectiveness), by collecting award holder and PO views on procedures, methods, activities and project results across the fund as a whole.

Key findings

Awards are making good progress towards desired outcomes and impacts. The survey findings highlighted good reports of awards making early progress towards desired outcomes and impacts, as framed by the results areas set out in the GCRF ToC. New insights and knowledge, and sustainable global R&I partnerships, emerged as areas where most respondents reported progress. Other results included new or improved management practice, knowledge, research findings, technology, methods and tools. The only area showing less progress was knowledge translation into commercial or business products or services, perhaps reflecting the lower proportion of

Spotlight on methodology

Survey purpose: To capture how GCRF investments have been working (process), and what has been achieved (effectiveness).

Survey development: In consultation with BEIS, the team selected core assumptions about how GCRF works, and hypotheses about its processes and results. Questionnaires were then developed for the award holder and partner organisation surveys.

Survey analysis: The analysis first generated descriptive statistics from both surveys (who, what, how many). A regression analysis was then used on the award holder data set to test the strength of the hypotheses. This allowed us to identify possible explanations and causal pathways for the findings identified in the descriptive statistics.

Award holder survey

Sample: Whole population of GCRF award holders
Response rate: 35% (3,612 complete responses)
Final data set: 3,456 cleaned responses matched to an award

Partner organisation survey

Sample: One PO respondent from each of GCRF's 143 programmes
Response rate: 87% (124 complete responses)
Final data set: 124 cleaned responses

commercially facing awards in the fund portfolio.

In terms of uses of R&I outputs, academic and research users were the most commonly reported. Policymakers at international, national and sub-national levels and multilateral organisations were also reported. GCRF awards from its 'signature programmes' - large-scale programmes that most closely aligned with the fund strategy of challenge-oriented, interdisciplinary R&I, representing about 50% of the fund's spend – were more likely to report usage by policymakers than non-signature award holders.

From the regression analysis, we can see that signature programmes produced a more comprehensive range of outputs – on average, one more than non-signature programmes. They also reached on average around 0.5 more users of programme information than non-signature programmes.

Key structures and processes within awards increased the probability of reporting outputs. The analysis identified key characteristics which increased the probability of reporting positive outputs, including a strategic framework, a Theory of Change (ToC), a dissemination plan, and a gender and inclusion plan.

Key processes which increased the likelihood of reporting positive outcomes included undergoing an evaluation, programmatic support to disseminate research products, and programmatic support to obtain additional funding.

What we see from the regression analysis is that having specific structures in the award helps to promote outcomes, rather than adding bureaucracy. This may be because structures and processes are required to effectively mobilise multi-partner collaborations, especially strategic frameworks, evaluation processes, and support for next stage funding. The investment in these seems worthwhile as collaboration with multiple partners, particularly with non-academic partners, is strongly associated with impact.

GCRF's large-scale, 'signature programmes' were more likely to report outcomes.

Signature programmes had an increased likelihood of reporting positive outcomes, and of research outputs being taken up by policymakers and other stakeholders, compared to other programmes. GCRF's signature programmes were designed as large-scale, multi-partner, multidisciplinary initiatives, designed around the principles of equitable partnerships and stakeholder engagement to promote use. Therefore, it is not surprising that the awards from signature programmes reported higher levels of structures and processes than non-signature awards. Signature programmes also tended to offer more programmatic support than other GCRF calls to help promote impact.

However, there are clearly limits to the enabling nature of structures and processes. The complexity of the signature awards may have curtailed the opportunities for partners to contribute to the design, which was perceived as a negative aspect of this type of grant.

Collaboration in award design and implementation is a key enabler of positive results. Collaborative awards including three or more non-academic partners were more likely to report a range of positive results, even when controlled for other factors. These results included positive research outputs and outcomes, effective capacity building, improved partnerships and networks, and success in obtaining additional funding.

Although collaboration with non-academic partners and inclusion in signature programmes are both associated with increased reporting of positive outputs and outcomes, the signature programmes themselves were less likely to be collaborative in design than other GCRF programmes.

Programme level support has positive effects on enhancing R&I capacities. Strengthening capacities for ODA research has been a key objective of GCRF, and is likely to be an important legacy of the fund in both low and middle income countries (LMICs) and the UK. The regression analysis found that programme level support received by award

holders has had positive effects on key R&I capacities. These include improved capacity to write research proposals, successful mobilisation of follow-on funding and improved knowledge of the research landscape.

LMIC-based survey respondents agreed that involvement in GCRF awards had contributed to new or improved skills – a key GCRF objective. The effect of this was strongest for the following dimensions:

- new or improved management practices, knowledge, or research findings;
- new or improved sustainable R&I partnerships;
- new or improved skills and infrastructure in targeted LMICs;
- new or improved stakeholder networks in LMICs.

Collaboration in design with three or more non-academic partners is again positively associated with increased probabilities of all the dimensions of capacity building surveyed, for both LMIC and UK respondents. LMIC respondents reported between 4.8 and 7.4 percentage point increase in achieving improved connections to UK and global networks and improved R&I skills and infrastructure in their countries. For UK respondents, the data suggest an increase of 8.8 pp in achieving improved R&I partnerships.

These findings highlight the importance of programmatic support for new types of capacity needed for partnered ODA R&I. Again, the signature investments were highlighted as providing more programmatic support than other types by design, but the PO survey confirmed that many other programmes also provided support. These findings highlight how programmatic support adds significant impact value to the grant investment, justifying the deployment of programme management resources.

Fairness in partnerships was also a factor linked to positive outputs and outcomes. The survey explored dimensions of fairness - fairness of opportunity (before research), fairness of process (during research implementation); fairness of benefit sharing (after the award). Awards that respondents perceived as fair in terms of equitable partnerships were strongly associated with reporting three or more positive outputs and outcomes. Including three or more non-academic collaborators was strongly correlated with improved perceptions of fairness. In addition, all measures of fairness significantly increased the likelihood of reporting three or more positive outputs and outcomes. Measures of fairness likewise increased the likelihood of reporting three or more positive outputs, with fairness of benefit sharing showing the largest impact. These findings highlight how ensuring fairness in all three dimensions is a driver of impact.

1 Introduction

This annex presents key results and analysis from a survey of the Global Challenges Research Fund (GCRF) award holders, with supporting evidence from a survey of GCRF partner organisations (POs).

Implemented between October 2021 and February 2022, the fund-wide survey was intended to capture how GCRF investments have been working (process) and what has been achieved (effectiveness), by collecting award holder and PO views on procedures, methods, activities and project results across the fund as a whole.

The award holder survey was sent out to over 10,000 GCRF award holders and partners (Principal Investigators (PIs) and Co-Investigators (Co-Is)). More than 3,000 responses were received, representing a 35% response rate. The PO survey was sent to one representative of each of GCRF's 143 programmes. In total, 124 complete responses were achieved, giving a response rate of 87%.

Section 2 presents the survey design and details the data collection process. Section 3 presents the methodology used for survey analysis and Sections 4 and 5 provide the findings and the regression analyses. Section 6 collects key findings and presents conclusions.

Summary of key findings

Key structures and processes within awards increased the probability of reporting outputs.

The analysis identified key characteristics which increased the probability of reporting positive outputs: a strategy framework, a Theory of Change (ToC), a dissemination plan, and a gender and inclusion plan.

Key processes that increased the likelihood of reporting positive outcomes included undergoing an evaluation, support to disseminate research products, and support to obtain additional funding.

GCRF's large-scale 'signature programmes' were more likely to report outcomes.

Signature programmes had an increased likelihood of reporting positive outcomes and of research outputs being taken up by policymakers and other stakeholders, as compared with other programmes.

Collaboration in award design and implementation is a key enabler of positive results.

Collaborative awards including three or more non-academic partners were more likely to report a range of positive results, even when controlled for other factors. These results included positive research outputs and outcomes, effective capacity building, improved partnerships and networks, and success in obtaining additional funding.

Fairness in partnerships was linked to positive outputs and outcomes.

Awards that respondents perceived as fair in terms of equitable partnerships were strongly associated with reporting three or more positive outputs and outcomes. Including three or more non-academic collaborators was strongly correlated with improved perceptions of fairness.

2 Methodology

This section outlines the survey's rationale and design, including scope, thematic content and limitations. The data collection process is then discussed and a summary of the final datasets is presented.

2.1 Rationale

The fund-wide survey was intended to capture how GCRF investments have been working (process) and what has been achieved (effectiveness), by collecting award holder and PO views on procedures, methods, activities and project results across the fund as a whole.

2.2 Survey development

The evaluation team conducted an initial desk review of information to support survey design, then carried out a consultation process with the Department for Business, Energy & Industrial Strategy (BEIS) – the government department responsible for administering GCRF – and the ten individual GCRF PO members of the GCRF Evaluation Working Group (EWG). The intentions were to understand their interests, establish GCRF award holder populations, and discuss challenges and options for survey design and administration.

2.2.1 Scope and sampling approach

The survey was conducted at two levels in order to gather data both on awards and on programmes.

2.2.1.1 Award holder survey

Given the diversity of GCRF awards, the scoping phase did not identify any suitable bases from which to sample, so the decision was made with BEIS to survey the whole population of GCRF award holders – both PIs, largely based in the UK, and Co-Is, largely based in low- and middle-income countries (LMICs).

Thus, the scope for the award holder survey included all awards administered through GCRF, both closed and active, with all award holders as potential respondents. The aim was to obtain one response from each respondent for their main award.

2.2.1.2 Partner organisation survey

The programme-level survey focused on the GCRF programmes under which the awards sit and which are managed by POs. The population was derived from a complete list of GCRF programmes. One respondent at PO level was then identified for each programme.

2.2.1.3 Other considerations

Some GCRF activities were considered to be out of scope for the survey, including policy workshops and other non-financial activities in which award holders engage. Programmes and awards that engaged in partnerships with individuals and organisations not funded by GCRF were also not included, largely because activities relating to these partnerships were not always recorded.

From 2016 to 2022, the Higher Education Funding Bodies (HEFBs) administered a distinct stream of GCRF funding, modelled on the quality-related (QR) funding UK higher education institutions (HEIs)

receive, and with different institutional systems and processes from the rest of the fund.¹ In this funding stream, HEFBs made annual allocations to over 100 HEIs in the UK in order to support their existing portfolio of GCRF research. Each HEI used their annual allocation to make awards within their institution, based on their own strategy. Data on award holders was therefore held at HEI level.

Identifying the correct individual award holders and collecting respondent data from more than 100 HEIs would have posed a significant logistical challenge. It was therefore not possible to include HEIs in the survey. This limits the extent to which the survey is representative of this aspect of the fund.

2.2.2 Survey population – award holder survey

The survey gathered information at the award level by targeting researchers who held GCRF awards. Although each PO had different types of award and award holder, it was possible to categorise them into two groups: primary and secondary award holders.

Primary award holders included PIs and lead applicants, and secondary award holders included Co-Is, researchers and other secondary applicants. Based on information received from POs, the evaluation team identified 2,699 awards, 2,212 primary award holders and 8,260 secondary award holders, which made up the total survey population (see Table 1:).

Table 1: Award holder survey population

PO type	# of awards	# of primary award holders	# of secondary award holders
UK Research and Innovation (UKRI) and Research Councils	1,575	1,242	6,366
Academies	1,094	940	1,793
UK Space Agency (UKSA)	30	30	101
Total	2,699	2,212	8,260

Note: several awards – especially under ‘UK Research and Innovation (UKRI) and Research Councils’ and ‘Academies’ – include researchers, training grant holders, fellows, primary supervisors, students, and others that work alongside the principal award holder (e.g. PIs).

2.2.3 Survey population – PO survey

At the programme level, 143 programmes were identified across the POs, with one respondent selected for each programme. The total population for the programme-level survey was therefore 143. Table 2: shows the number and distribution of programmes across POs.

Table 2: GCRF programmes by PO

Partner organisation	Number of GCRF programmes
UKRI (and research councils)	112
Royal Society (RS)	8
British Academy (BA)	11

¹ QR funding is paid annually to higher education institutions as a block grant to support the full economic cost of research. This is administered by the Higher Education Funding Bodies – the Department for the Economy Northern Ireland, the Higher Education Funding Council of Wales, Research England and the Scottish Funding Council. The amount awarded related to the quality and extent of an institution's research portfolio.

Royal Academy of Engineering (RAE)	9
Academy of Medical Sciences (AMS)	2
UKSA	1
Total	143

2.2.4 Survey thematic content: testing assumptions and gathering quantitative data on uncertainties

Stage 1b of the GCRF evaluation focused on the signature investments and on links to results and early outcomes. The survey was designed to provide generalisable, fund-wide data to test a selection of core hypotheses related to these areas.

The survey data ensured compatibility with the qualitative analyses from the signature investment process evaluations, through alignment with the main evaluation question (MEQ) and sub-evaluation questions (sub-EQs) for Stage 1b (see Table 3: **Error! Reference source not found.**). Because the EQs were too broad to collect comparable quantitative data across GCRF, a more focused questionnaire was developed covering EQs 1–5.

The team first listed the core assumptions around how GCRF interventions are delivered. These assumptions allowed the team to develop a list of areas for the survey to address – where additional evidence would allow for better understanding of implementation processes, impact mechanisms and interactions with context. In consultation with BEIS, the team prioritised key areas for the survey to investigate and gather generalisable data on. Hypotheses were then developed. Selecting a small number of core hypotheses aided development of a focused questionnaire for PO management and award holders and facilitated specific survey data analysis.

Table 3: Stage 1b evaluation questions

MEQ: How are GCRF's investments working and what has been achieved?
EQ 1. To what extent are structures and processes in place to support challenge-led R&I [research and innovation] with development impact within signature investment awards and programmes?
EQ 2. To what extent are structures and processes in place to strengthen R&I capacity in LMICs and the UK?
EQ 3. To what extent are processes to support challenge-led research efficiently implemented? Are they proportionate for UK and LMIC stakeholders, are they timely and do they offer value for money?
EQ 4. To what extent have the signature programmes made early progress towards their desired outcomes/impacts, and what evidence exists of these?
EQ 5. What particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes in different contexts?
EQ 6. What can be learned about the additionality (uniqueness) of GCRF funding from: how the signature investments have adapted their approach in response to Covid-19; the impact of the 2021 funding cuts on the signature investments?
EQ 7. What lessons can inform improvements in the future delivery of the signature investments and promote learning across GCRF?

The team arrived at a list of hypotheses through the following steps:

- Two core GCRF interventions were identified from GCRF mission statements: promoting and carrying out research, and creating a supporting R&I environment.

- These two interventions were then compared with GCRF ToC outputs and outcomes in order to develop assumptions about how interventions were linked to results.
- Using the Stage 1b evaluation framework as a guide, the team then developed hypotheses about the processes leading from intervention to outputs and outcomes. The survey questionnaire (see Table 4:) was then designed to test the strength and applicability of these hypotheses.

2.2.5 Survey composition

Based on these assumptions and related hypotheses, two questionnaires were developed – one for the award holder survey and one for the PO survey – covering the areas outlined below.

Award holder survey 2

39-question questionnaire, gathering data from award holders on:

- general project information
- structures and processes for project implementation
- monitoring, evaluation and learning (MEL)
- achievements
- utilisation of GCRF-funded research
- Covid-19 and budget reductions
- personal Information.

PO survey

21-question questionnaire, gathering data from POs for each of their GCRF programmes on:

- general information
- structures and processes
- MEL.

² GCRF grants are commonly referred to as awards. As this is not a uniformly agreed term across GCRF award holders, the term 'Project' was used in the survey questionnaire to refer to awards/grants.

Table 4: Survey assumptions and hypotheses

EQ	Assumptions	Hypotheses
1	<p>GCRF programmes are defined, set up and managed effectively by POs to support challenge-led R&I with development impact</p> <ul style="list-style-type: none"> ▪ Selection of topics/programmes/regions/countries for awards is relevant and coherent ▪ Challenges are correctly identified and elaborated (e.g. shared vision and existence of ToCs) ▪ Awards/programmes are commissioned based on potential to deliver against challenge ▪ PO management identifies capacity needs, risks and builds in flexibility ▪ Awards/programmes have regular dedicated management to support R&I from conceptualisation to use ▪ MEL is applied to awards/programmes <p>Programmes are designed and implemented to ensure R&I with development impact</p> <ul style="list-style-type: none"> ▪ Design of awards/programmes is relevant to challenge and GCRF aims and is coherent with related portfolio ▪ Design of awards/programmes is pro-poor and includes gender equality, social inclusion and poverty (GESIP) considerations and inclusiveness & participation from the outset (local stakeholders are engaged in design) ▪ Award/programme activities correspond to GCRF interventions ▪ Award/programme activities engage at country level and with local stakeholders 	<p>1.1: Signature investment management processes make a difference to research/official development assistance (ODA) excellence compared to other programmes.</p> <p>1.2: Programmes with MEL structures produce more outputs/better outcomes.</p> <p>1.3: GCRF programmes and programme designs are generally inclusive (or collaborative) to varying degrees across countries and programmes.</p> <p>1.4: More inclusion in design of programmes results in increased participation throughout award length, more relevant outcomes and stronger positioning for use of outputs.</p>
2	<p>Structures and processes strengthen and build R&I capacity (in LMICs and UK)</p>	<p>2.1: Primary and or/secondary award holders receive support/leadership/guidance/information from GCRF (e.g. Challenge Leaders, mentoring, etc.)</p>

	<ul style="list-style-type: none"> ▪ Primary and or/secondary award holders receive support/leadership/guidance/information from GCRF (e.g. Challenge Leaders, mentoring, etc.) ▪ Primary and or/secondary award holders are connected to sector or multisector R&I networks/partnerships and activities ▪ Primary and or/secondary award holder activities are linked to/engaged in tracking of outcomes/ToCs, etc. ▪ Primary and or/secondary award holders receive access to R&I infrastructure/technology and knowledge 	<p>2.2: LMIC based award holders are connected to global and UK R&I networks through structures created through GCRF awards</p> <p>2.3: LMIC based award holders receive exposure to R&I infrastructure/technology and knowledge</p> <p>2.4: UK based award holders collaborate more with LMIC researchers resulting in innovative, LMIC relevant outputs/outcomes</p> <p>2.5: GCRF funding builds capacity for award holders to apply for further funding (through GCRF or elsewhere)</p> <p>2.6: GCRF programme and programme designs are generally inclusive (collaborative) to varying degrees across countries and programmes.</p> <p>2.7: More inclusion (collaboration) in design of programmes results in increased participation throughout award length, more relevant outcomes and stronger positioning for use of outputs.</p>
<p>3</p>	<p>Processes and structures are efficient, timely, proportionate and fair</p> <ul style="list-style-type: none"> ▪ Primary and or/secondary award holders receive resources, be it funding or other (e.g. knowledge or technological support), at the right time and for the right length of time ▪ Resources, be it funding or other (e.g. knowledge or technological support), are sufficient for (proportionate to) the award/programme ▪ Awards/programmes provide for fair partnerships, e.g. equitable, inclusive and transparent 	<p>3.1: GCRF funding catalyses R&I in various thematic areas.</p> <p>3.2: GCRF funding stimulates other funding opportunities.</p> <p>3.3: The majority of GCRF funding is sufficient and timely to deliver.</p> <p>3.4: GCRF research funding supports fairness of opportunity (before research), fairness of process (during research implementation) and fairness of benefit sharing (after the award).</p>
<p>4</p>	<p>Evidence of early progress towards desired outcomes exist (both positive and negative)</p> <ul style="list-style-type: none"> ▪ New approaches and reframing of challenges are emerging, demonstrated by outputs (e.g. publications) and outcomes (e.g. new research/products/services based on award activities) ▪ Technological and practical solutions to development problems are being and have been tested or implemented in LMICs 	<p>4.1: Challenge-led, practical R&I outputs are increasing in the UK and Global South due to GCRF funding.</p> <p>4.2: GCRF funding has catalysed new networks – sectoral, multisectoral, and interdisciplinary – globally and with the UK.</p> <p>4.3: There is evidence of GCRF-supported R&I being utilised by stakeholders in a range of processes, including policy, planning and programming, business, enterprise and investments.</p>

	<ul style="list-style-type: none"> ▪ LMIC researchers have improved capabilities to engage in challenge-focused interdisciplinary cross-sectoral work (including applying for other challenge-led funding) ▪ Pro-poor policies and practices are emerging or have emerged as a result of inclusive practices ▪ Sectoral, intersectoral and multidisciplinary partnerships and networks are established and/or LMIC researchers are connected to networks 	
5	<p>Structural and contextual factors will shape outcomes (test for the following assumed influences on outcomes):</p> <ul style="list-style-type: none"> ▪ political environment ▪ economic environment ▪ research capacity and environment ▪ data environment (i.e. data availability and agreement on measures) ▪ connection to networks 	<p>5.1: Structural and contextual barriers to carry out GCRF programmes are greater in low-income countries (LICs) than in middle-income countries (MICs).</p>

2.2.6 Challenges

During the review and consultation process, three main challenges to carrying out a GCRF-wide survey were identified. These challenges had implications for the design and administration of the survey, and were addressed in collaboration with BEIS.

Consistency and availability of award-level data: At the time of survey design, respondent data (names, types of award holder, contact details, etc.) and key award data were held at the PO level. There was significant variation in the accuracy and completeness of respondent data across the POs. The lack of a consolidated GCRF award holder database complicated the process of establishing a target population within a reasonable margin of error. Information that was inaccurate or out of date also delayed the roll-out of the survey in some instances.

Reductions in ODA spend: The survey was administered in 2021 and early 2022, in the context of the cuts to GCRF funding that arose from reductions to ODA spending. Where award holders were negatively affected by the impact of the cuts, the team identified a significant risk to response rates.

Exclusion of HEFBs: As discussed above, it was not possible to include the GCRF funding allocated directly by HEFBs in the survey population. This limits the extent to which the survey is representative of this part of the fund.

2.3 Data collection

2.3.1 Survey administration

The survey was managed and administered by Itad. Following consultation with BEIS on the best way to optimise response rates, POs provided support to this, including sharing survey links and reminders. Table 5: outlines the high-level procedure and timeline for the survey.

Table 5: Survey administration timeline

Activity	Description
Survey piloting	The survey was piloted with members of the BEIS Technical Experts Group, Newton Fund award holders and the Itad team to ensure the tool was appropriate and practical.
PO communications	Draft survey communication materials were shared with POs: <ul style="list-style-type: none"> ▪ information sheet and privacy notice (via weblinks) ▪ process and email template to administer survey, including background and aims, timelines ▪ Reminder 1, 2 & 3 email templates.
Survey launch (20 October 2021)	POs administered survey to award holders based on agreed databases.
Reminder 1 (3 November 2021)	POs administered reminder 1, with Reminder 1 template.
Reminder 2 (10 November 2021)	POs administered reminder 2, with Reminder 2 template.
Reminder 3 (17 November 2021)	POs administered reminder 3, with Reminder 3 template.

Due to delays to the UKRI-run Interdisciplinary Hubs programme, this part of the award holder survey was rolled out later, in January 2022. The PO survey was launched on 26 October 2021, running until 19 November 2021. This was extended to 14 January 2022 for UKRI.

2.4 Summary statistics of responses and data achieved

2.4.1 Award holder survey

The award holder survey was sent to a total of 10,472 award holders and achieved 3,612 complete responses, representing a 35% response rate. The award holder data was then cleaned³ and matched to grant IDs, resulting in 3,456 usable responses, each matched to an award.

Analysis of the patterns of responses across signature and non-signature investments shows that awards with more named PIs and Co-Is were more likely to have at least one survey response. Awards of longer duration and those still ongoing were also more likely to respond. After processing, the PI share of the usable matched responses was 44.8% and the Co-I share was 55.2%. Overall, the response and matching rates were high, meaning that a wide range of sizes, duration and types of award was covered, with good representation across POs.

Table 6: gives a full breakdown of award holder survey respondents.

2.4.2 Partner organisation survey

The PO survey was sent to a total of 143 respondents – one from each GCRF programme. There were 124 complete responses, representing an 87% response rate. Table 7: shows how responses were distributed across POs.

The results and findings from the POs are included throughout the report, providing triangulation and counterpoints for the main findings from the award holder survey.

Table 6: PO survey responses by PO

Partner organisation	Frequency	Percentage of final dataset
Arts and Humanities Research Council	19	15.3%
AMS	2	1.6%
BA	11	8.9%
Biomedical and Biological Sciences Research Council	11	8.9%
Engineering and Physical Sciences Research Council	10	8.1%
Economic and Social Research Council	15	12.1%
Medical Research Council	29	23.4%
Natural Environment Research Council	7	5.7%
RAE	9	7.3%
RS	8	6.5%
Science and Technology Facilities Council	2	1.6%
UKSA	1	0.8%
Total	124	100%

³ For example, removing incomplete responses and those that had not permitted the sharing of their identifying information.

Table 7: Summary of award holder survey population and response rates by PO⁴

	Total population primary award holders	Total population secondary award holders	Total	Total responses #	Total response rate %	Failed responses	Not consented	Final # of usable database responses	Responses (PI) #	PI share of usable database %	Responses (Co-I) #	Co-I share of usable database %
UKRI	1242	6366	7608	2713	31.8%	254	73	2102	771	36.7%	1331	63.3%
RS	221	94	315	283	89.8%	7	6	283	209	73.9%	74	26.1%
BA	302	770	1072	353	32.9%	42	8	301	160	53.2%	141	46.8%
RAE	238	770	1008	318	31.5%	32	8	277	131	47.3%	146	52.7%
AMS	179	159	338	167	49.4%	15	9	143	87	60.8%	56	39.2%
UKSA	30	101	131	73	55.7%	6	0	67	14	20.9%	53	79.1%
Unassigned	-	-	-	-	-	-	-	283	79	27.9%	204	72.1%
Total	2212	8260	10472	3907	34.5%	356	104	3456	1451	42.0%	2005	58.0%

⁴ Description of categories in this table:

Total population primary award holders: The total number of unique primary award holders from databases obtained from POs, where an email address was listed. Award holders were requested to submit one response – that of their largest-value award; therefore duplicates with lower values were removed.

Total population secondary award holders: The total number of unique secondary award holders from databases obtained from POs, where an email address was listed. Award holders were requested to submit one response – that of their largest-value award; therefore duplicates with lower values removed. If listed as both primary and secondary, the largest-value award remains.

Total: The total number of unique award holders from databases obtained from POs.

Total Responses #: The total number of responses to the survey.

Total response rate %: The total % response rate (total responses #/total*100).

Failed responses: The number of incomplete responses; these have been disqualified.

Not consented: The number of respondents that did not consent to sharing of their data. Respondents opting out of sharing special category only have had special category data removed from their response.

Final # of usable database responses: The number of survey responses in the dataset that have not been disqualified or removed due to no consent of processing data. Each response is listed against a GCRF programme under a PO.

Responses (PI) #: The number of respondents from the 'Final # of usable database responses' that identified as primary award holders.

PI share of usable database %: The share of the usable dataset that identified as a primary award holder (Responses (PI) #/Final # of usable database responses*100).

Responses (Co-I) #: The number of respondents from the 'Final # of usable database responses' that identified as secondary award holders.

Co-I share of usable database %: The share of the usable dataset that identified as a primary award holder (Responses (Co-I) #/Final # of usable database responses*100).

Unassigned: Responses where it was not possible to identify a PO.

3 Analytical approach

3.1 Overview of approach

Analysis of the datasets took a two-part approach. The first part of the analysis generated descriptive statistics, or frequencies, in order to understand how many and which kinds of respondents answered questions in given ways. This was applied to both the award holder survey and the PO survey. The second part of the approach involved a regression analysis of the award holder survey dataset. Regression analyses allowed us to test the strength of the hypotheses (outlined in Table 4:) by controlling for key variables and characteristics associated with given outcomes. This allowed us to identify possible explanations and causal pathways for the findings identified in the descriptive statistics. The PO survey population was too small to apply regression analysis methods, so this part of the analysis focused on the award holder survey.

3.2 Statistical model

This subsection gives a technical overview of the statistical model used to analyse the award holder survey responses.

We fitted logistic regressions with post-estimation marginal analysis to find the influence of key covariates on our outcomes of interest. Specifically, we fitted the following model:

$$\text{logit}(Y_{ip}) = \alpha + \beta_n C_{ip} + \beta_m X_i + \beta_o X_p$$

where Y indicates our outcome of interest for individual (or respondent) i as part of programme p .

Some key examples are ‘did the award achieve three or more positive outcomes’ and ‘did the award achieve three or more positive outputs’; however, outcomes vary throughout and between EQs and are specified within the corresponding EQ findings tables. C indicates a vector of interest, primarily defined as binary variables such as ‘if the award was part of a signature programme’, ‘if the respondent was involved in the design’ and ‘if there were three or more non-academic partners involved in the design’. β_n indicates the coefficients of interests. Covariates of interest vary by EQ and are specified in the corresponding tables. X_i and X_p indicate the vectors of individual and award-level characteristics controlled for, with corresponding coefficients β_m and β_o . These are as follows:

- Award characteristics: Covid and budget disruption, location of the respondent, location of programme, award size category, programme elapsed months, programme duration months if the programme has already concluded.
- Respondent characteristics: seniority, status within the programme (PI or secondary), gender, respondent’s organisation type.

Associated coefficients are not reported.

All models were estimated with robust standard errors clustered at the grant level. We used post-estimation analysis to predict the mean level of our covariates of interest while holding all other variables at their respective means. All analysis was conducted in Stata version 17 and Excel.

3.3 Survey matching

Award holder surveys were matched to award duration and award size, using their grant ID and email addresses if provided. This led to a matching rate between survey responses and duration/award size of 86.4%. Unmatched cases were excluded from the dataset. However, no systematic differences were found between matched and unmatched responses. This indicates that those unmatched cases had no appreciable impact on representativeness.

3.4 Key variables

Two of our key covariates of interest are 'did the award achieve three or more positive outcomes' and 'did the award achieve three or more positive outputs', which are measured using questions in the survey. Those outputs and outcomes that were selected were aggregated into the binary indicators used in the analysis and capture the range of outputs and outcomes the respondent reported.

3.5 Limitations

The following limitations were considered when interpreting the results and drawing conclusions from the statistical analyses:

- Awards of higher value with longer durations were more likely to return a response, as were those still ongoing. PIs were also more likely to respond than Co-Is. This has the potential to introduce bias in our estimates of the correlation between these factors and positive outcomes.
- All the data is self-reported. Surveys were answered by all individuals named on grants. This means that individuals on the same awards may have different perceptions of the same issues within an award, e.g. the extent of fairness or level of outcome. Instead of attempting to analyse further and risk making further assumptions, we interpret the data as the respondent's perception or knowledge of the programme.

Some variables will therefore have been interpreted differently by different respondents. For example, judgements will have varied about which results qualified as outputs or outcomes, or what constituted a barrier. Results should, therefore, still be considered as associative rather than causal.

4 Findings

This section presents the findings of the survey. First it gives an overview of the respondents, awards and programmes which make up the population of each survey. It then addresses each EQ in turn, presenting key findings from the award holder and PO surveys.

4.1 Overview of award holder and award characteristics

Overview: Key takeaways

Although 59% of respondents were based in high-income countries (HICs), the majority of research took place in MICs (71%) or LICs (26%).

Of the total usable responses from the award holder survey, 2,987 (86%) were matched to award size and award dates. On average, two respondents per award answered the survey. The majority of respondents were established researchers (78%) based in universities (81%). A full overview of respondent characteristics is shown in **Error! Reference source not found.**

14% of responses came from GCRF's signature investments,⁵ and the rest from across GCRF's other programmes. There was considerable diversity in the size of awards, from a mean size of £35,000 in the lowest quintile to a mean size of £8.7 million in the largest. Awards had an average length of 30 months across the fund as a whole. A full overview of award characteristics is shown in Table 8:. One point to note is that although 59% of respondents were based in HICs, the large majority of research actually took place in MICs (71%) or LICs (26%), with 3% being conducted in HICs.

Table 8: Award characteristics

Variable	Frequency	Percentage of total
Type of GCRF programme (2,987 responses)		
Signature programme award	412	13.8%
Other GCRF programme award	2,575	86.2%
Award location (2,987 responses)		
HIC	95	3.2%
Upper middle-income country	754	25.2%
Lower middle-income country	1,357	45.4%
LIC	781	26.1%
Distribution of size of awards by quintile (2,983 responses)		
Lowest: 0%–20% (mean size £35,588)	602	20.2%
Lower: 20%–40% (mean size £156,415)	592	19.8%
Middle: 40%–60% (mean size £384,691)	596	20.0%
Higher: 60%–80% (mean size £1,244,863)	598	20.0%

⁵ Six flagship programmes that represent the 'essence' of what GCRF was set up to achieve – transformative R&I that is interdisciplinary, multisectoral and challenge-focused to drive development impact. Around £824 million has been disbursed through the six signature investments from 2016 to 2022.

Highest: 80%–100% (mean size £8,770,620)	595	19.9%
Award concluded by date of survey completion (2,987 responses)		
Concluded	1,722	57.6%
Not concluded	1,265	42.4%

Table 9: Respondent characteristics (Award holder survey)

Variable	Frequency	Percentage of total
Respondent job role (2,987 responses)		
Primary (principal investigator, Fellow, Training grant holder)	1,274	42.7%
Secondary (co-investigator, subcontractor, student, researcher, etc.)	1,713	57.3%
Respondent location (2,987 responses)		
HIC	1,767	59.2%
Upper middle-income country	449	15.0%
Lower middle-income country	601	20.1%
LIC	170	5.7%
Sex (2,987 responses)		
Female	1,208	40.4%
Male	1,680	56.2%
Non-binary	8	0.3%
Prefer not to say	91	3.0%
Professional experience (2,987 responses)		
Established researcher	2,340	78.3%
Early career researcher	586	19.6%
Student	41	1.4%
Prefer not to say	20	0.7%
Type of research organisation (2,987 responses)		
Government	58	1.9%
Industry/private sector	72	2.4%
Non-governmental organisation (NGO)	99	3.3%
Research institute/think tank	331	11.1%
University	2,427	81.3%

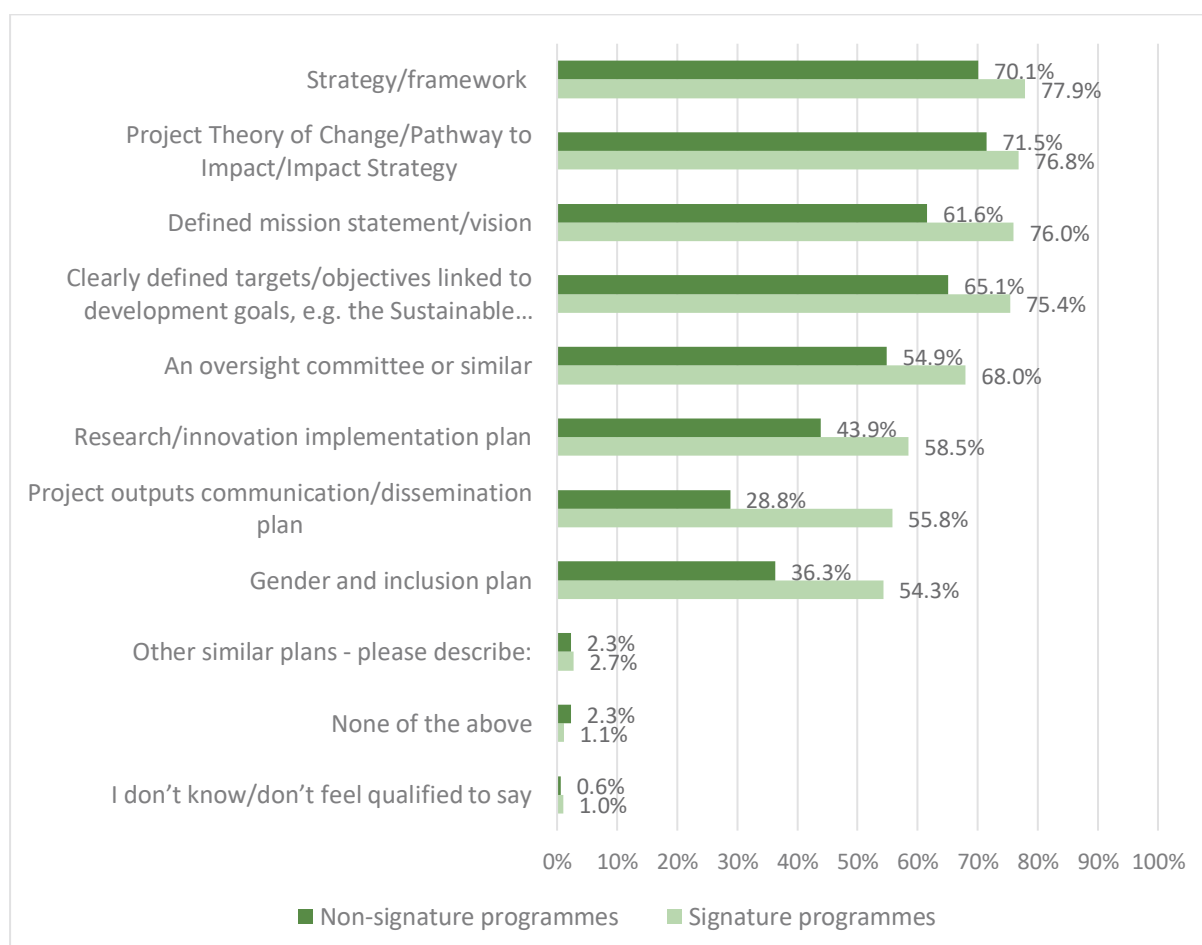
4.2 EQ 1: To what extent are structures and processes in place to support challenge-led R&I with development impact within signature investment awards and programmes?

This section presents the key structures, processes and types of support reported by award holder and PO survey respondents, and examines some differences between signature and non-signature programmes.

EQ 1: Key takeaways
Signature programme award holders reported higher levels of all the structures and processes included (e.g. ToC, mission statements, oversight committee) than non-signature programmes.
Signature programme award holders also reported higher levels of support from their programmes, including networking opportunities, dissemination of outputs, and support with implementation.

The award holder survey asked respondents to report on key structures and processes present in their awards. Signature programme award holders reported higher levels of all the structures and processes included in the questionnaire. In particular, award holders from signature programmes were more likely to report having an oversight committee (55.8%, compared to 28.8% in non-signature programmes), a programme ToC (76%, compared to 61.6%), and a gender and inclusion plan (54.3%, compared to 36.3%). Responses are presented in **Error! Reference source not found.**, d isaggregated by signature and non-signature programme award.

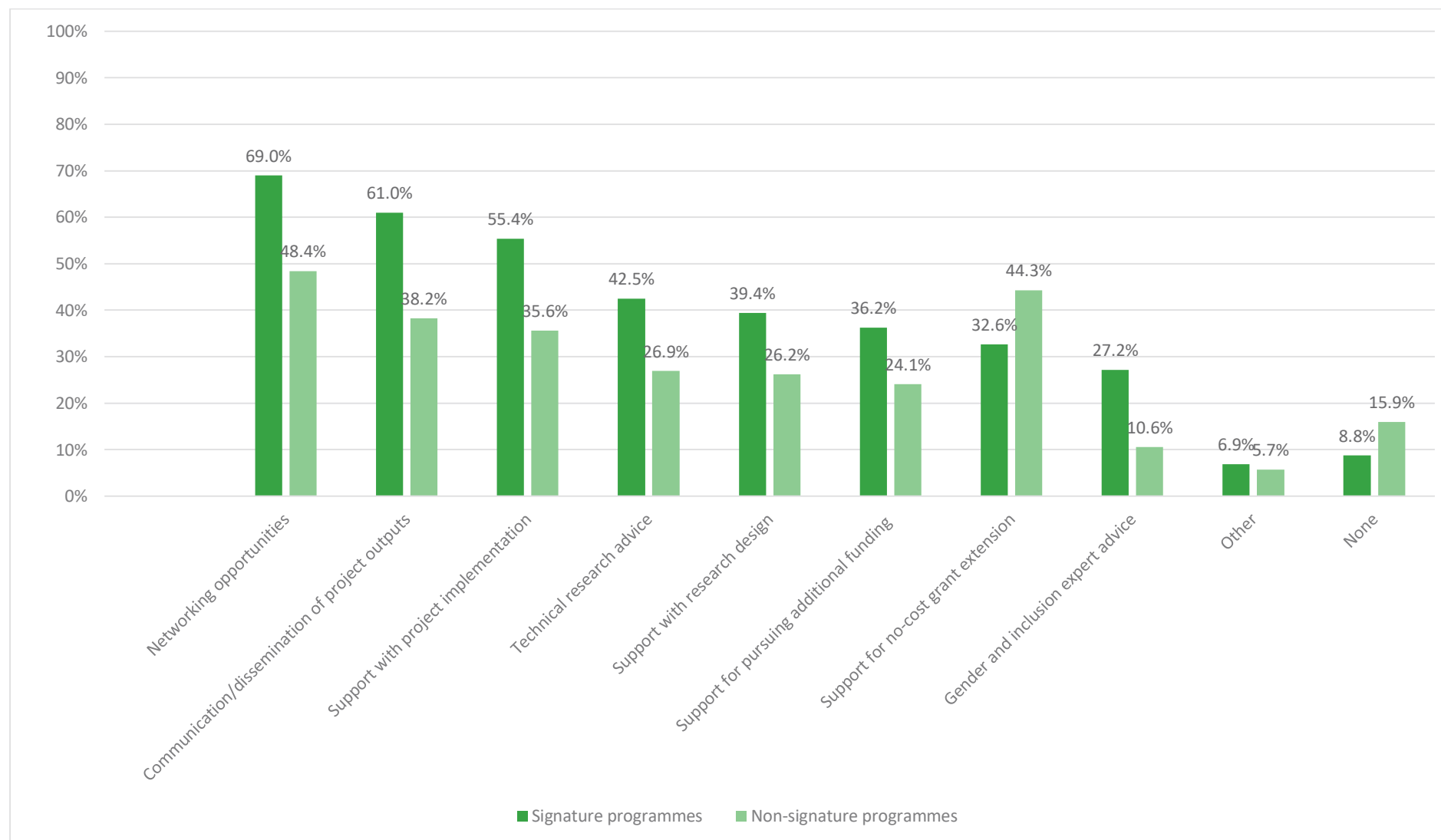
Figure 1: Does your project have any of the following structures and processes for project implementation? (Award holder survey)



The PO survey data suggests that it was more common to have a ToC in place at project level rather than at programme level. Although 75.8% of POs reported having a ToC in place, only 27.4% of POs reported actively using it in their management of programmes. Of the programmes which had a ToC in place but did not use it, 56.7% were programmes that started before 2017. This suggests that the presence and use of key processes and structures improved over the life of the fund.

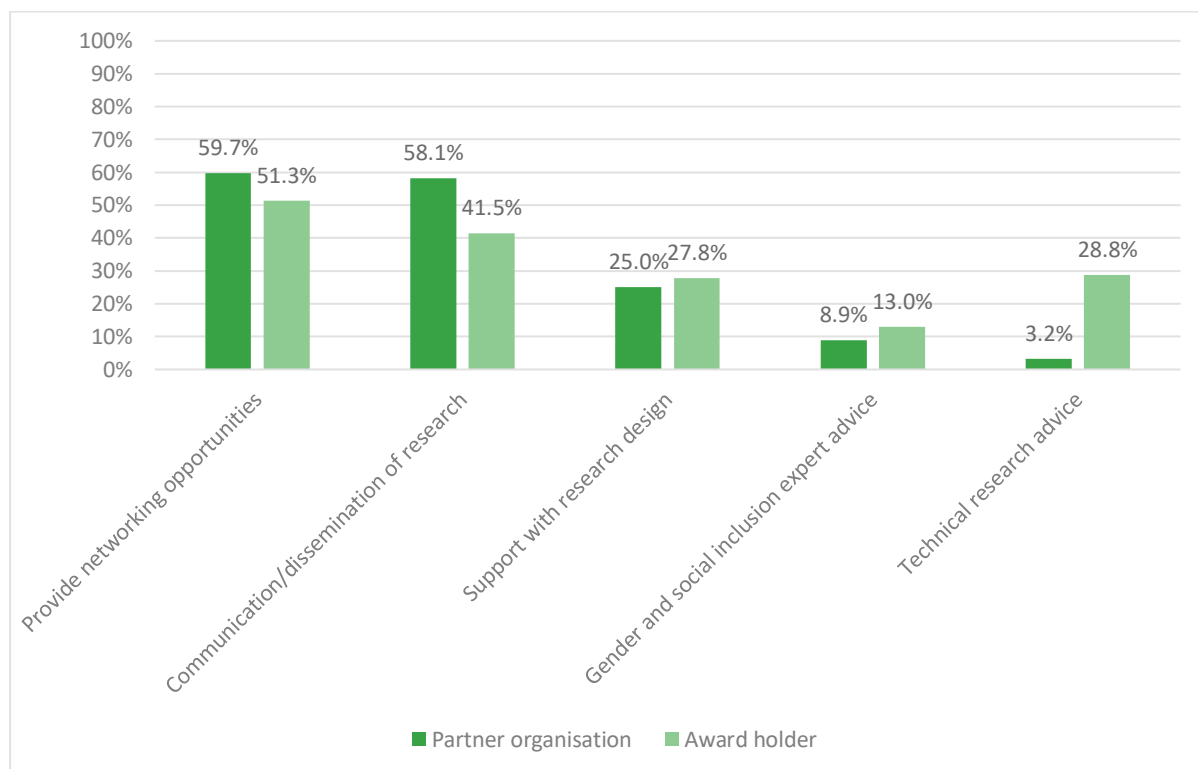
The survey also gathered evidence on the GCRF support made available to award holders. This was particularly pertinent to GCRF, as enhanced capabilities in both UK and LMIC research landscapes is one of the key results the fund intends to achieve. Again, award holders who were part of signature programmes reported higher levels of almost every type of support included in the survey. In particular, they were more likely to report receiving support with dissemination activities (61%, compared to 38.2%), with networking activities (69%, compared to 48.4%) and with programme implementation (55.4%, compared to 35.6%). The exception to this was in reported levels of support to gain a no-cost grant extension; 44.3% of non-signature award holders reported receiving this support, compared to 32.6% of signature award holders.

Figure 2: Which of the following types of support have you received from your funder or lead research institution? (Award holder survey)



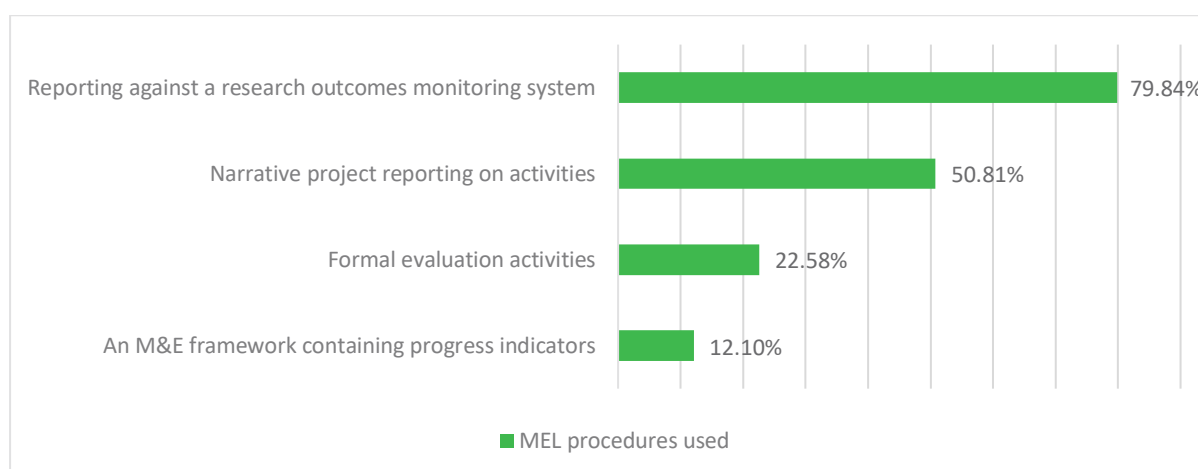
PO perceptions of the main types of support they provide broadly mirror experiences of award holders, with the exception of technical research advice. Only 3.2% of PO respondents reported offering technical research advice; 28.8% of award holders reported receiving it. As award holders were asked about support from funders and lead research institutions, this suggests that institutions have taken the lead in offering technical advice where needed.

Figure 3: Levels of key types of support offered by POs and award holders (award holder and PO survey)



The most commonly utilised MEL procedure is ‘reporting against a research outcomes monitoring system’, with nearly 80% of the projects adopting it. Approximately half of the projects (50.81%), use ‘narrative project reporting on activities’. Only 22.58% of the projects engage in ‘formal evaluation activities’, and only 12.10% utilise ‘an M&E [monitoring and evaluation] framework containing progress indicators’ (see Figure 4:).

Figure 4: Most common MEL procedures (PO survey)



4.3 EQ 2: To what extent are structures and processes in place to strengthen R&I capacity in LMICs and the UK?

This section presents survey results related to the types of capacity building experienced by respondents and the reported impacts of these activities. The differences between LMIC and UK stakeholders are noted.

EQ 2: Key takeaways
The most often reported types of programme-level support received were assistance with networking opportunities, assistance with securing a no-cost grant extension, and assistance with communicating or distributing research outcomes.
GCRF award support and research experience significantly enhanced proposal writing and understanding of the research landscape.

The surveys collected data from respondents on the type of programme-level support they received and on the impact on their R&I skills. Support with networking opportunities, with obtaining a no-cost grant extension, and with communicating or disseminating research outputs were the most frequently reported types of programme-level support received. When comparing this with what was offered to award holders, discrepancies emerge. For instance, about one-third of award holder survey respondents indicated that they received technical research advice, yet only 3% of POs reported providing this support to award holders. Interestingly, more award holders believed they received support with research design and programme implementation than was (reportedly) offered by POs, hinting at possible variations in the perception of the support extended.

Overall, although only about 15% of respondents reported going without any form of support, these insights suggest that there might be gaps in communication or understanding about the support on offer (see **Error! Reference source not found.**). Regardless, the majority clearly had access to some form of support at the programme level.

Table 10: Comparison of types of programme support reported by award holder survey respondents with type of support offered to award holders

Type of programme support in place	Reported by award holders (award holder survey; number of respondents = 3,454)	Offered to award holders (PO survey; number of respondents = 124)
Networking opportunities	51.3%	59.68%
Support for obtaining no-cost grant extension	43.6%	-
Communication/dissemination of project outputs	41.3%	58.06%
Support with programme implementation	38.3%	31.45%
Technical research advice	28.6%	3.23%
Support with research design	28.1%	20.1%
Support for pursuing additional funding	26.2%	44.35%
Gender and inclusion expert advice	12.9%	8.87%

Support to equitable partnership development	-	32.26%
None of these	14.9%	-

The support offered and the experience of conducting research as part of a GCRF award appear to have had the largest impact on improved capacity to write research proposals and on improved knowledge of the research landscape (see Figure 5:). Just over half of the respondents reported having applied for future funding, with success for 27% of signature award holders and 30% of non-signature award holders. Results from the PO survey suggest that POs may have contributed to this; 44.4% of PO respondents reported offering award holders support to pursue additional funding.

The analysis next focused on LMIC respondents, as one of GCRF's core aims is to ensure that capacity building occurred in LMICs and not only in the UK.

There was strong agreement from LMIC-based survey respondents that involvement in GCRF awards had contributed to new or improved skills (see Figure 6:). The effect of this was strongest for the following dimensions:

- new or improved management practices, knowledge or research findings
- new or improved sustainable R&I partnerships
- new or improved skills and infrastructure in LMIC target countries
- new or improved stakeholder networks in LMICs.

There were much lower levels of reported improvement in commercial skills, products or services – probably because fewer awards across the fund were innovation-based (as evidenced by the high rate of 'don't know' responses from LMIC award holders).

Table 11: presents data from the PO survey on the various capacity building investments. Among the different activities and procedures, investment in assessment and implementation activities was most prominent, followed by informal guidelines. Interestingly, audits received almost no investment, and there were several 'N/A' responses, indicating no investment at all being made in local capacity. When considering the broader metric of having at least one activity that invests in local capacity, two-thirds of POs (84 out of 124) indicated at least some form of investment.

Table 11: Types of capacity building investments made (PO survey)

Investment in local capacity	Percentage 'yes' (total number of respondents = 124)
Assessment and implementation activities	53.2%
Formal policy	10.0%
SOPs/policy directives or similar	8.1%
Informal guidelines	41.9%
Audits	1.6%
None of the above	32.3%
At least one activity	67.7%

Figure 5: How have the skills gained from your project enabled you to apply for funding elsewhere? (Award holder survey)

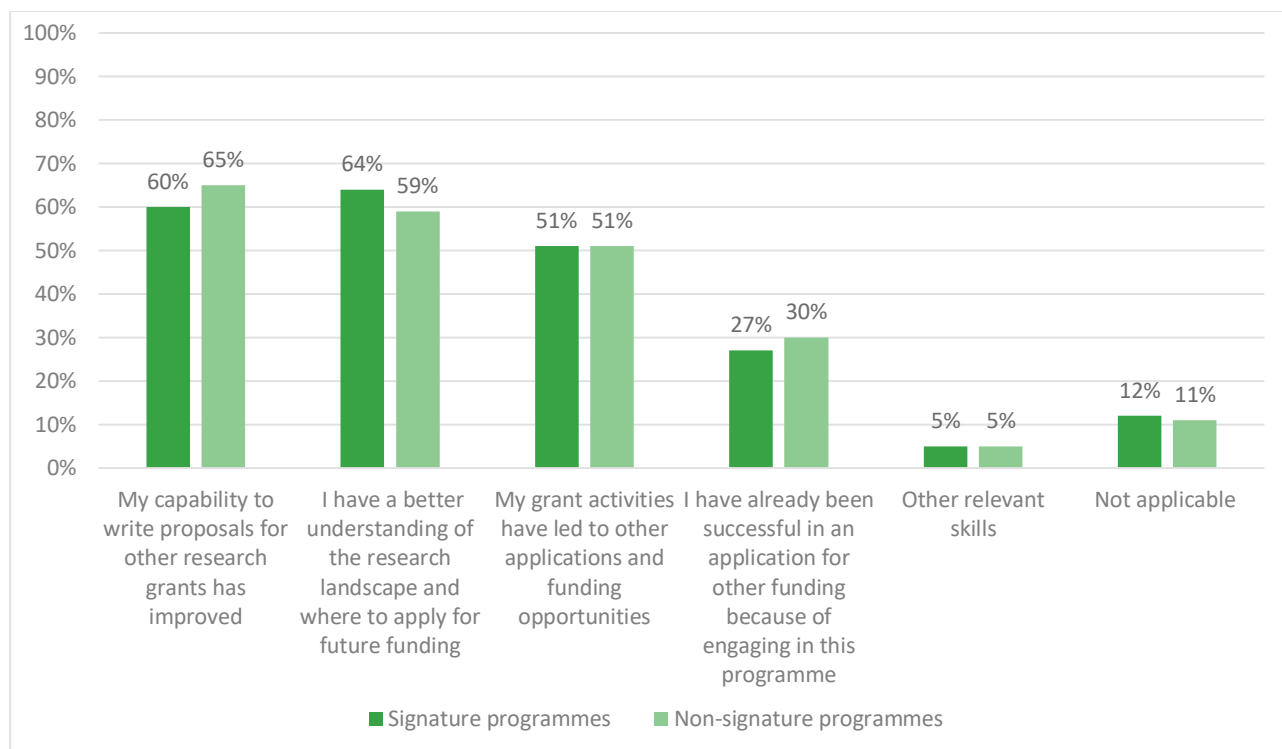
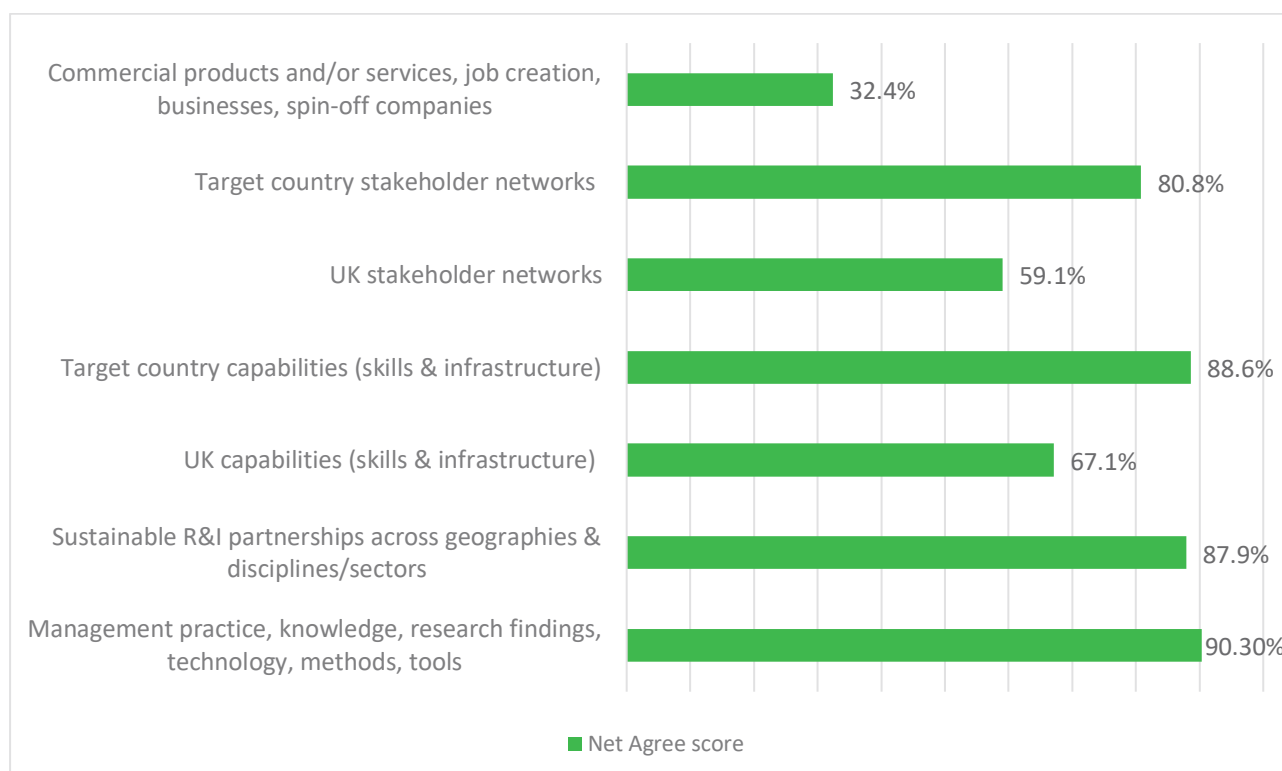


Figure 6: To what extent do you agree that the project has contributed to the following outcomes? (LMIC award holder respondents only)⁶



⁶ The NET Agree score for each category is calculated to provide a summary of overall sentiment. The following formula is used to calculate it: NET Agree score = (% of respondents who 'Agree') + (% of respondents who 'Strongly Agree').

4.4 EQ 3: To what extent are processes to support challenge-led research efficiently implemented? Are they proportionate for UK and LMIC stakeholders, are they timely and do they offer value for money?

This section presents an overview of the thematic R&I areas undertaken by GCRF programmes. It then presents evidence on the timeliness and sufficiency of GCRF funding and the extent to which participation allowed respondents to obtain further funding. Respondents' perceptions of fairness are then presented.

EQ 3: Key takeaways
The majority deemed GCRF funding sufficient, but fewer received it in a timely manner. Additionally, 26.9% obtained additional funding, representing both HIC and LIC awardees.
The majority of POs prioritised fairness in opportunity and benefit sharing, with special attention to financial fairness (more than to process fairness). Award holders perceived fairness of opportunity in the fund more favourably than fairness of process or benefit sharing.

4.4.1 Thematic R&I areas catalysed by GCRF research

Survey data found that GCRF programmes, both signature and non-signature, had resulted in research across a diverse range of thematic areas. Health, environment and climate research were the thematic areas most frequently reported by survey respondents (see **Error! Reference source not found.**). Signature programmes reported notably higher levels of research relating to environment and climate issues.

4.4.2 Funding sufficiency and timeliness

Although a majority of survey respondents found the level of GCRF funding received to be sufficient, fewer than half received the funding in a timely way. 54.6% of award holders judged the level of funding to be sufficient or more than sufficient (see Figure 7:). The number who agreed that funding was received in a timely or more than timely way was notably smaller, however, at only 44.1%. This suggests problems or delays with disbursement that affected award holders.

4.4.3 Obtaining further funding

The survey also gathered data on the extent to which holding a GCRF award led to further funding opportunities. 26.9% of respondents reported that they had successfully applied for further funding, with successful applications distributed across HIC and LIC award holders (see Figure 8:). UK award holders were three percentage points (pp) more likely to have successfully applied for funding than those from either HICs or LICs. This suggests a slight but not significant advantage to UK-based researchers. Award holders from HICs and LICs successfully pursued further funding at the same rates, however, demonstrating fairness in this aspect of the fund. Fairness is discussed more fully in Section 4.4.4.

Table 12: What are the main research/thematic areas of your project? (Award holder survey)

Research area	Signature programmes		Non-signature programmes	
	N=	%	N=	%
Agriculture/agri-technology	51	9.7%	215	7.3%
Archaeology and heritage	0	0.0%	40	1.4%
Big data/information communication technology	1	0.2%	37	1.3%
Biodiversity	12	2.3%	34	1.2%
Creative industries/creative economy	1	0.2%	36	1.2%
Disaster resilience and management	40	7.6%	183	6.2%
Ecology	13	2.5%	17	0.6%
Economic development	6	1.1%	62	2.1%
Education (including higher education)	4	0.8%	224	7.6%
Energy (including renewables)	20	3.8%	130	4.4%
Environment/climate	86	16.4%	195	6.7%
Food security	34	6.5%	115	3.9%
Health/healthcare	112	21.2%	839	28.7%
Manufacturing	0	0.0%	11	0.4%
Migration/demographic change	24	4.6%	77	2.6%
Research infrastructure	2	0.4%	31	1.1%
Rural or urban development	17	3.2%	80	2.7%
Science and technology capacity building	15	2.9%	123	4.2%
Space and space applications	0	0.0%	13	0.4%
Waste and recycling	1	0.2%	55	1.9%
Water and sanitation	39	7.4%	136	4.6%
None of the above/other	47	9.0%	278	9.5%
Total	525	100.0%	2931	100.0%

Figure 7: To what extent did you find GCRF funding to be sufficient and timely? (Award holder survey)

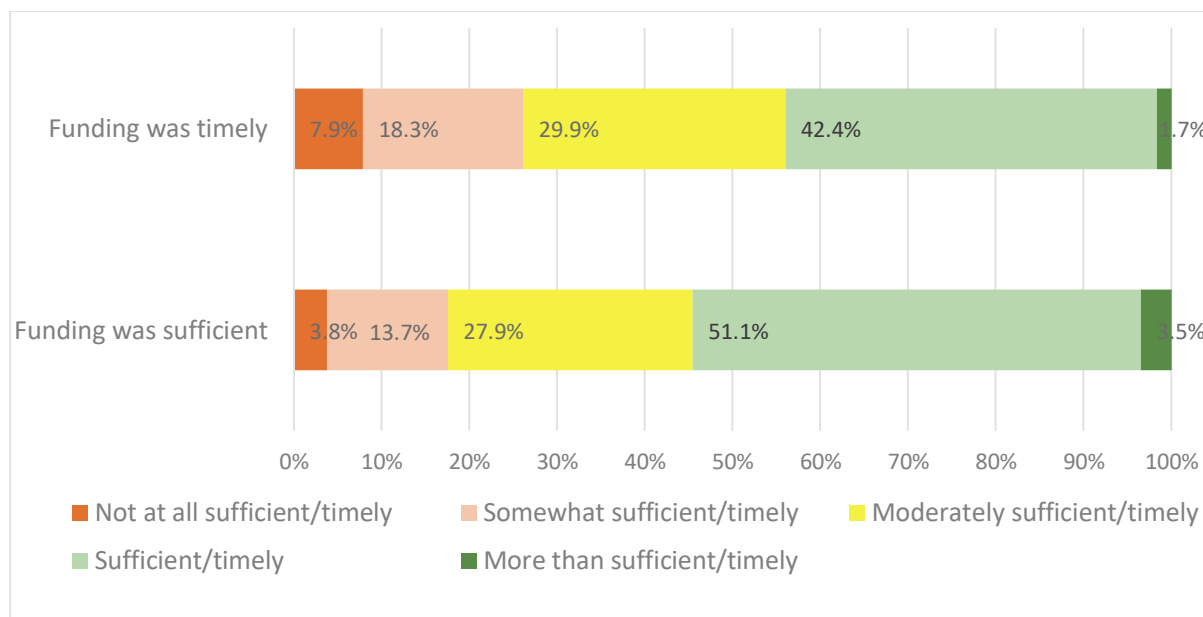
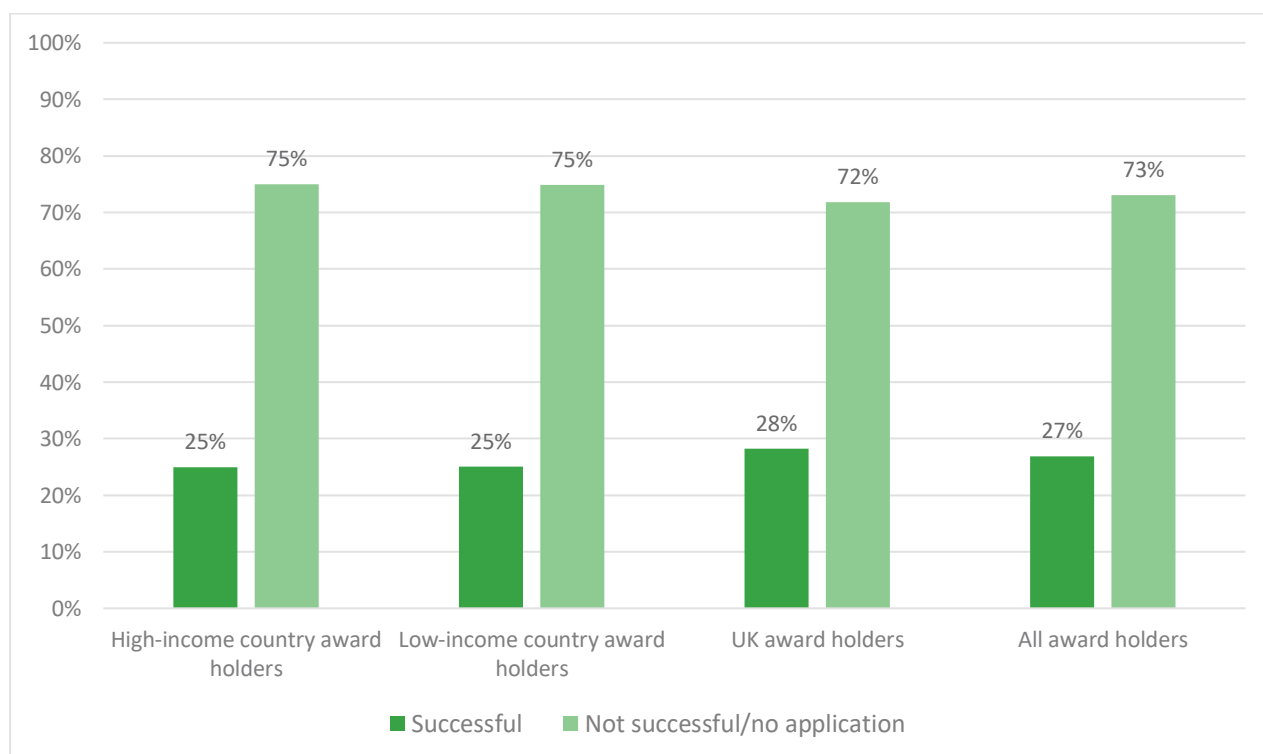


Figure 8: Levels of success in obtaining further funding by country income level (award holder survey)



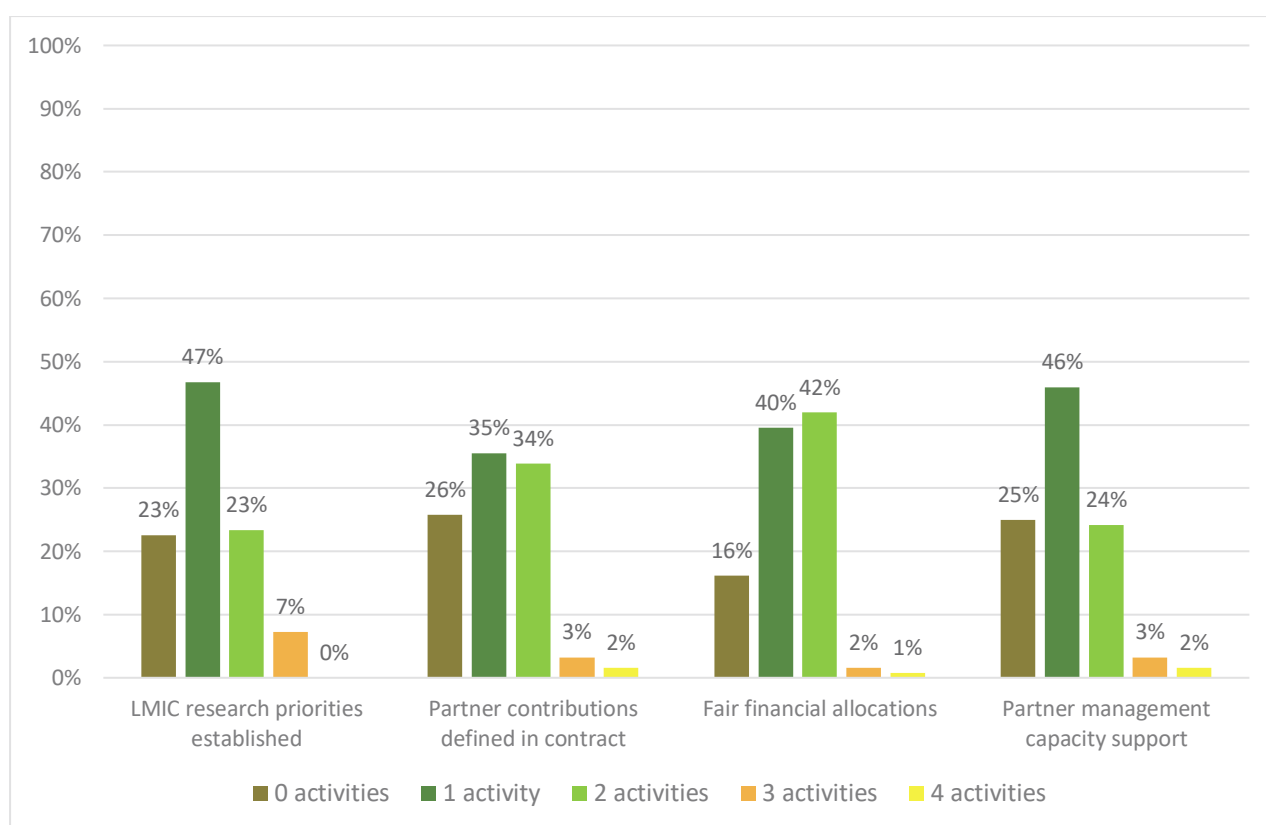
4.4.4 Fairness

The survey also included three broad dimensions of fairness: the opportunity dimension refers to fairness in applying for and receiving GCRF funding; the process dimension refers to fairness during implementation of the research itself; the benefit sharing dimension refers to fairness in distribution of any positive results of the research.

A majority of POs reported conducting activities to support fairness of opportunity, process and benefit sharing, with more activities reported relating to opportunity and benefit than to process. In terms of fairness of opportunity, fairness in financing appears to have been a focus for POs. The

PO survey asked respondents to report different activities they had undertaken to promote fairness of opportunity for award holders. The questions focused on four different areas: activities to ensure LMIC research priorities were addressed; activities to define partner contributions clearly in the contract; activities to allocate finances fairly; activities to provide partner management capacity support.⁷ 84% of respondents reported that their programme carried out at least one activity to support fair allocation of finances. In comparison, 77% undertook at least one activity to assess LMIC research priorities, 74% conducted at least one activity to define partner contributions, and 75% carried out at least one activity to support partner management. Figure 9: gives a breakdown of the number of activities reported in each of these areas.

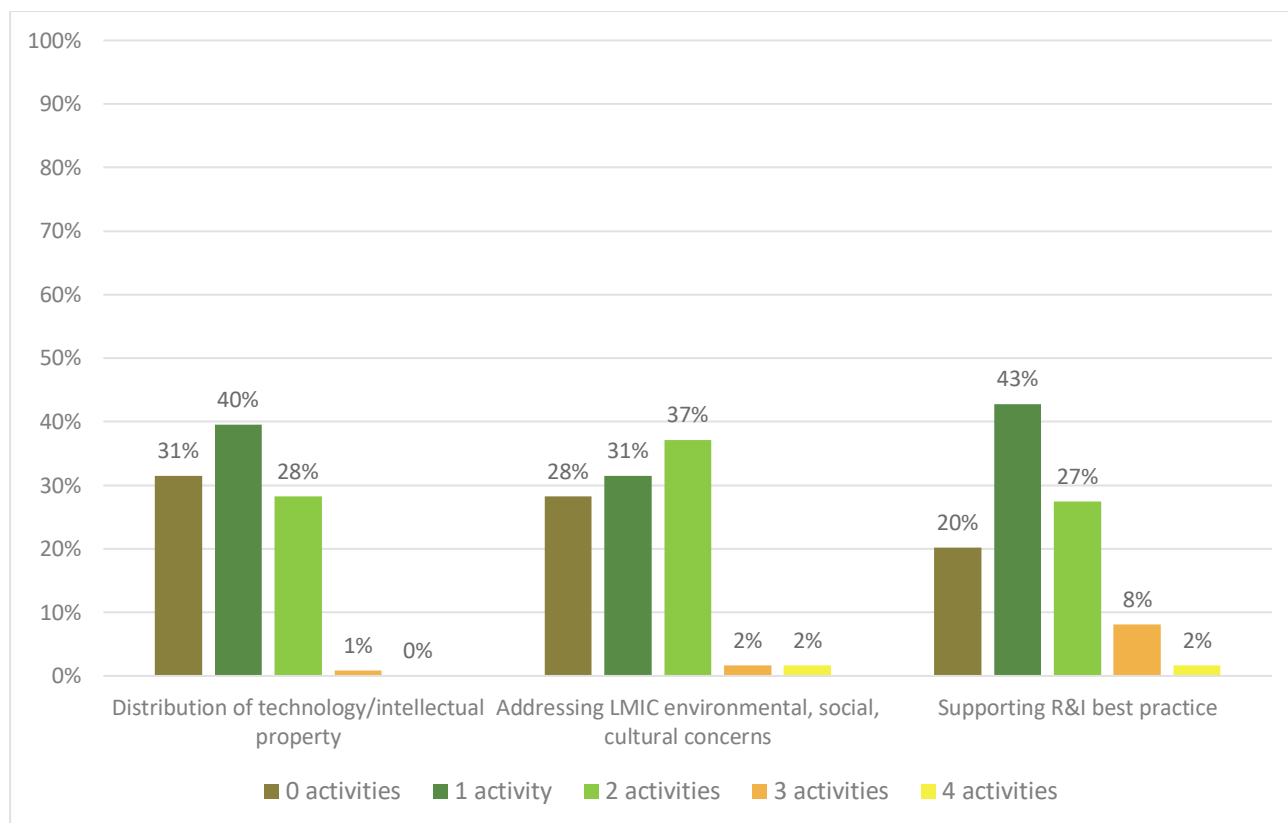
Figure 9: Which activities has your programme carried out to support fairness of opportunity for R&I collaborations for UK and LMIC award holders? (PO survey)



POs reported similar levels of activities to support fairness of benefit sharing. Programmes were most likely to have carried out activities to ensure adherence to international R&I best practice, with 80% reporting at least one activity. 72% reported at least one activity designed to address environmental, social and cultural concerns in LMICs. Levels were slightly lower for activities supporting distribution or intellectual property or technology – 69% reported at least one activity in this area. Figure 10: gives a full breakdown of activities reported relating to fairness of benefit.

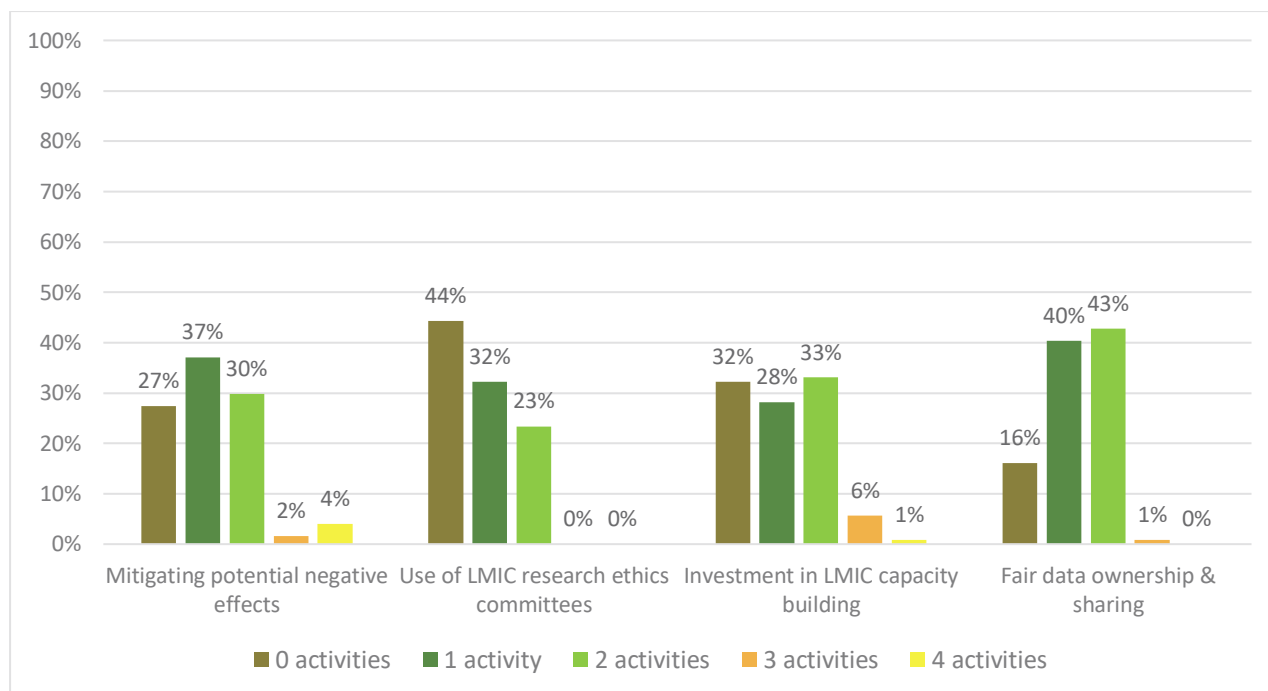
Figure 10: Which activities has your programme carried out to support fairness of benefit in R&I collaborations for UK and LMIC award holders? (PO survey)

⁷ Activities were defined as follows: assessment and implementation activities, formal policy, policy directives, informal guidelines, and audits.



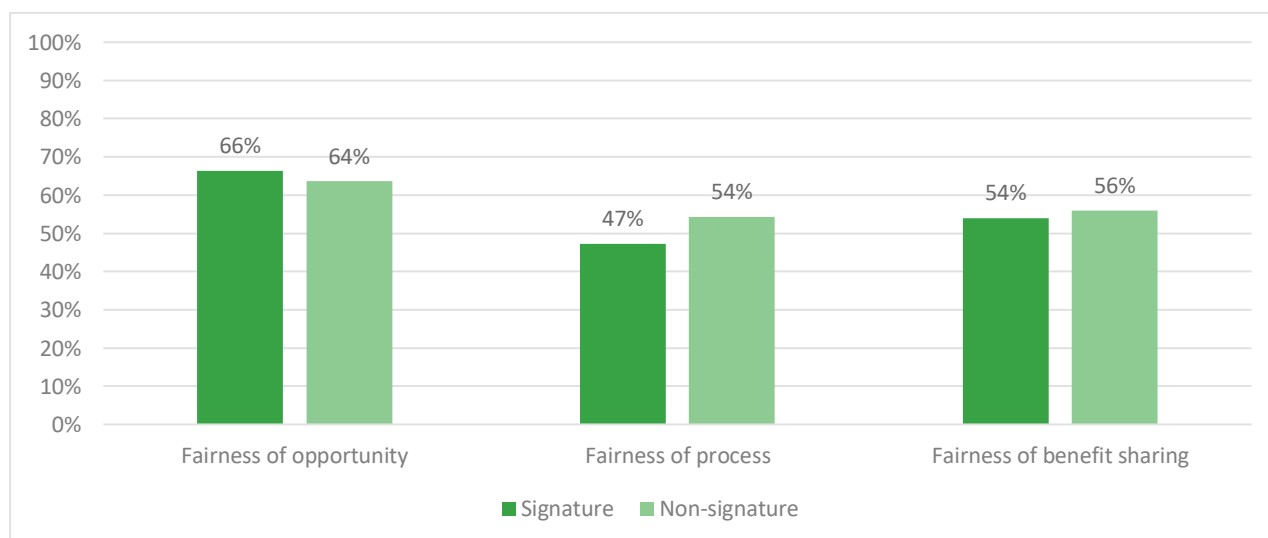
POs generally reported lower levels of activity relating to fairness of process. Fairness of data ownership and sharing was the exception to this; 84% of programmes conducted at least one activity in this area. PO respondents were asked if their programme had undertaken activities to mitigate potential negative effects, to work through LMIC research and ethics committees, to invest in LMIC capacity building, and to ensure fair data ownership and sharing. In particular, only 56% of programmes reported activities involving LMIC research and ethics committees. This suggests that UK institutions and structures were more dominant in questions of research approval and ethics; this is a lower proportion than might be expected in a fund built on principles of equitable partnership. Figure 11: gives a full breakdown of activities reported relating to fairness of process.

Figure 11: Which activities has your programme carried out to support fairness of process in R&I collaborations for UK and LMIC award holders? (PO survey)



The award holder survey likewise indicates that the fund performed better in terms of fairness of opportunity than in terms of process. 66% of signature award holders and 64% of non-signature award holders agreed or strongly agreed that their award offered fairness of opportunity. Perceptions of fairness of process and benefit sharing were lower (see Figure 12:). In particular, signature award holders were less likely to agree that the implementation process was fair; only 47% agreed or strongly agreed that this aspect of the fund demonstrated fairness. Signature programmes were explicitly designed around equitable partnerships, so expectations of fairness were likely higher than in other programmes, and possibly were harder to meet. Signature programmes also typically had more involved administrative and reporting requirements than non-signature programmes; these two factors together may have contributed to perceptions of a lack of fairness.

Figure 12: Percentage of respondents who agreed or strongly agreed that GCRF awards provided fairness of opportunity, process and benefit sharing (award holder survey)



4.5 EQ 4: To what extent have the signature programmes made early progress towards their desired outcomes/impacts, and what evidence exists of these?

This section presents an overview of the range of outcomes and outputs reported by respondents across four key result areas defined in the GCRF ToC. This gives an indication of the early progress being made across the GCRF portfolio.

EQ 4: Key takeaways

GCRF awards showed early progress in fostering new insights and sustainable R&I partnerships, although translating insights into commercial products was an exception.

Early progress was reported by respondents. The survey confirmed that GCRF awards had contributed to a broad range of results across four key areas indicated in the fund's ToC (see Annex 1 for full context):

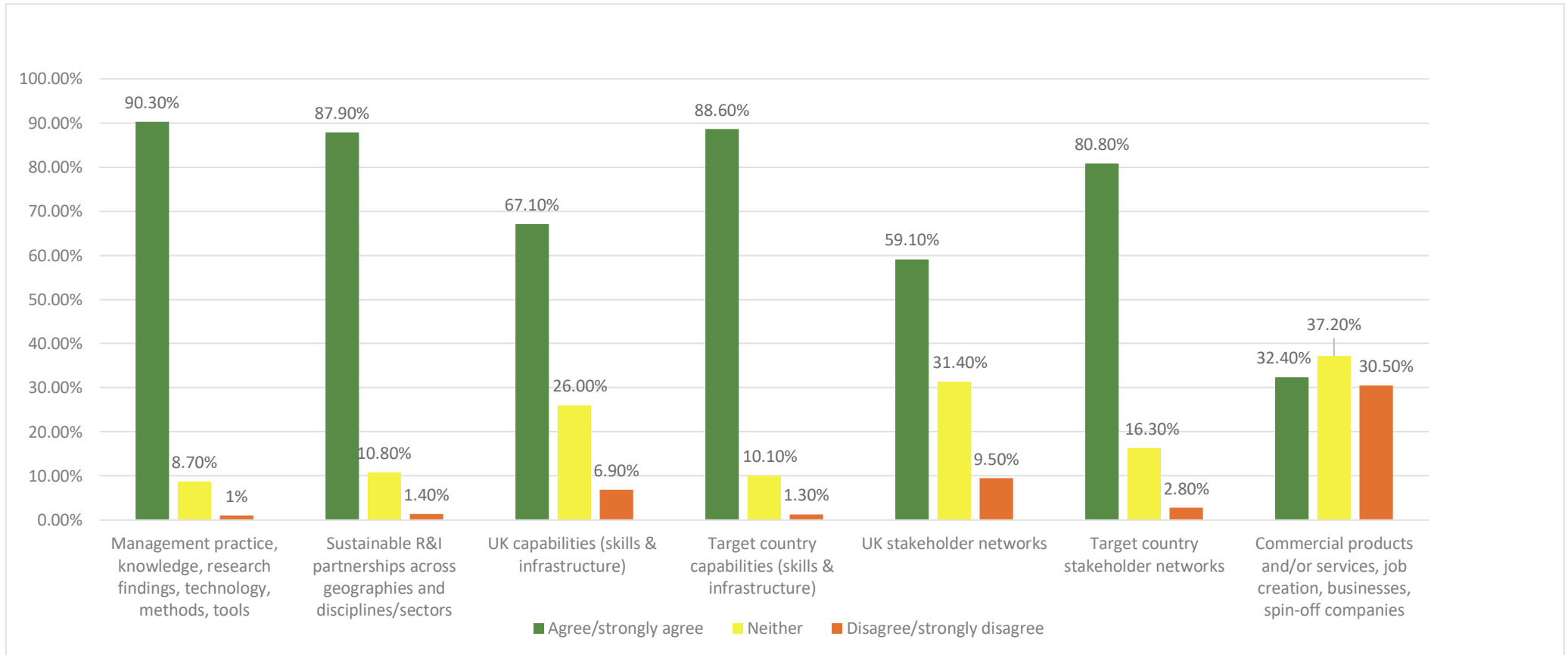
- high-quality interdisciplinary research and cross-sectoral innovation provides **new insights and knowledge** for translation into policies, practices, products and services;
- sustainable global **R&I partnerships** established across geographies and disciplines;
- **enhanced challenge-oriented capabilities** (skills and infrastructure) for R&I established in the UK, partner countries and regions;
- **stakeholder networks** for use and replication established across research, policy, practice, civil society and enterprise in partner countries, internationally and the UK.

New insights and knowledge, and sustainable global R&I partnerships, emerged as areas where GCRF awards have made good early progress. 89% of respondents agreed or strongly agreed that programmes contributed to new or improved management practice, knowledge, research findings, technology, methods and tools. 88% of respondents noted GCRF's contributions to new or improved sustainable global R&I partnerships across geographies and disciplines (see Figure 13:).

The aspect of new insights and knowledge relating to translation into commercial or business products or services was an exception to this. Only 31% of respondents agreed or strongly agreed that GCRF programmes had contributed to commercial products and/or services, job creation, businesses or spin-off companies. This may reflect the greater number academic and policy-related research programmes in GCRF's portfolio.

Enhanced challenge-oriented capabilities and stakeholder networks both emerged as areas where there was a notable difference between results in the UK and in target countries. Respondents were significantly more likely to report positive results in target countries than in the UK. 89% of respondents agreed or strongly agreed that new or improved capabilities had resulted in target countries, compared to 67% in the UK. Similarly, 81% of respondents reported new or improved stakeholder networks in target countries, with only 59% in the UK. It is possible that these aspects were perceived by respondents as more established in the UK than in target countries before GCRF. This also aligns well with the core GCRF aim of building capacity and contributing benefits in LMICs.

Figure 13: To what extent do you agree that your project contributed to the following outcomes? (Award holder survey)⁸



⁸ The NET scores provide a comprehensive picture of survey respondents’ attitudes towards a specific topic or category. These scores are calculated as follows:
 NET Agree score = (% of respondents who ‘Agree’) + (% of respondents who ‘Strongly Agree’).
 NET Neither score = % of respondents that indicate ‘Neither’ (neither agree nor disagree).
 NET Disagree score = (% of respondents who ‘Strongly Disagree’) + (% of respondents who ‘Disagree’).

The data also demonstrated the breadth of R&I outputs reported across the fund as a whole. The most commonly cited outputs included: publication of peer-reviewed journal articles; development of new techniques, protocols and ways of working; developing new research groups or networks. Figure 14: shows the most frequently reported outputs across all survey respondents, and Table 13: gives a full breakdown by signature and non-signature respondent.

Figure 14: Most commonly reported GCRF R&I outputs (award holder survey)

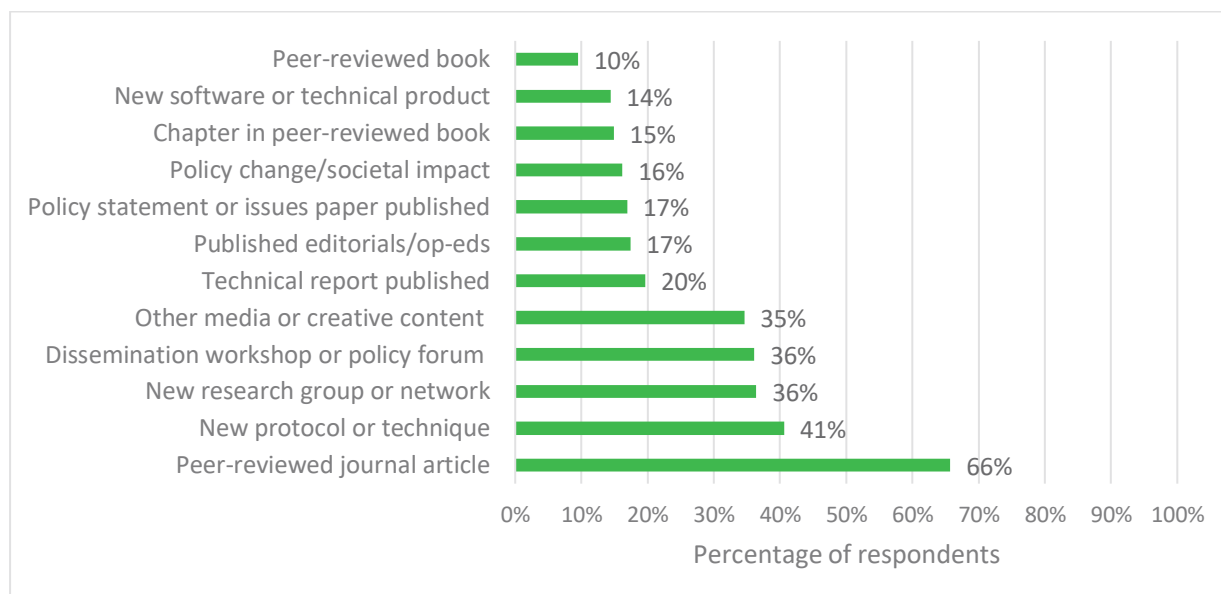


Table 13: Full breakdown of R&I outputs reported by signature and non-signature respondents (award holder survey)

Type of output produced	Total signature respondents		Total non-signature respondents	
	N=	%	N=	%
Publication of a peer-reviewed journal article (either as a main author or co-author)	411	78%	1850	63%
Published editorials/op-eds	161	31%	437	15%
Publication of a peer-reviewed book or edited volume	83	16%	242	8%
Publication of a chapter in a peer-reviewed book or edited volume	148	28%	365	12%
Production of a technical report (published)	160	30%	516	18%
Production of a policy statement or issues paper (published)	161	31%	424	14%
A policy change/societal impact at either the organisational/institutional, local, national or international level	124	24%	438	15%
Established a new research centre	49	9%	134	5%
Intellectual property rights protection received (patent approved, trademark approved, etc.)	9	2%	62	2%
Developed new software or technical product	70	13%	426	15%

Developed new protocol, technique, or way of doing things	238	45%	1164	40%
New flora or fauna breed/variety	1	0%	30	1%
A joint venture agreement reached	23	4%	128	4%
Spin-out or start-up company/enterprise formed to exploit intellectual property	13	2%	50	2%
Agreed a licencing arrangement (for transfer of knowledge/technology)	11	2%	67	2%
Held a dissemination workshop or policy forum with decision makers	221	42%	1026	35%
A new research group or network has been set up	214	41%	1042	36%
Other media or creative content (e.g. interviews, blogs, podcasts, TED talks, films, exhibitions, educational art content, etc.)	232	44%	959	33%
Other – please specify	61	12%	561	19%
None of the above	21	4%	226	8%
Don't know	23	4%	91	3%
Total/per programme	2434		10238	

4.6 EQ 5: What particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes in different contexts?

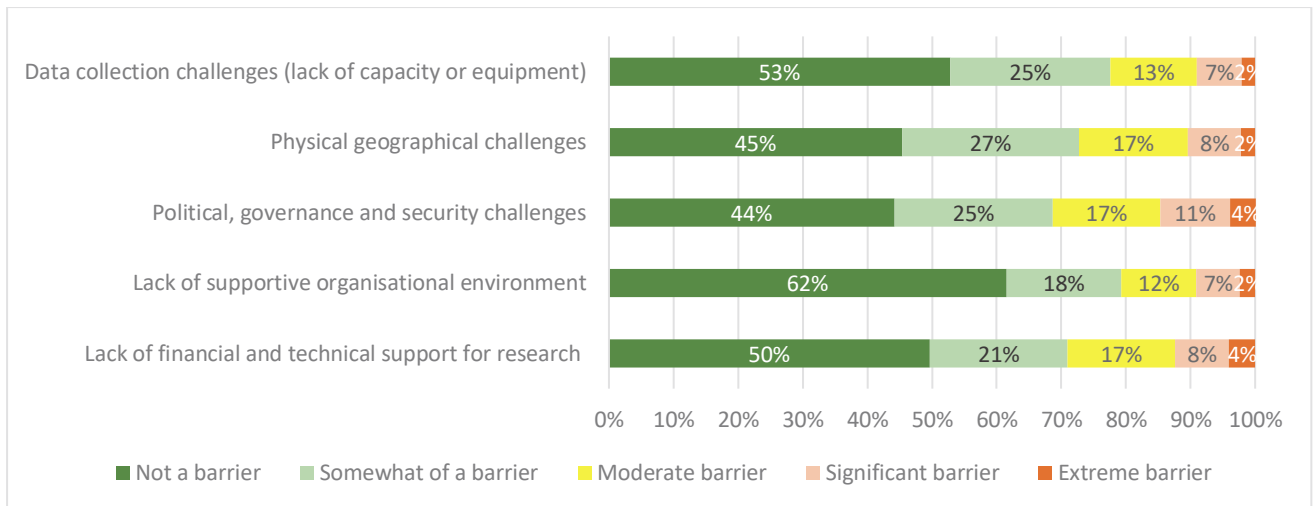
This section presents an overview of barriers experienced by respondents in awards, and of their severity.

EQ 5: Key takeaways

The survey identified five key barriers for award holders, with political, governance and security challenges and inadequate technical and financial support being the most significant.

The award holder survey collected data on five broad categories of barriers experienced by award holders. Respondents were most likely to report (i) political, governance and security challenges and (ii) a lack of technical and financial support for research as extreme or significant barriers (15% and 12% respectively; see Figure 15:). The lack of a supportive organisational environment appeared to be the least significant barrier; 62% of respondents reported that it was not a barrier in their research.

Figure 15: Barriers reported by respondents and their severity (award holder survey)



5 Regression analysis

This section presents regression analyses of the survey report findings. It examines key variables, controlling for other factors, to see which types and features of GCRF awards are more likely to be associated with positive results, based on the hypotheses developed during survey design. The analysis is presented by EQ, including a summary of the analysis, a breakdown of the key hypotheses, and the analysis itself.

5.1 EQ 1 regression analysis: To what extent are structures and processes in place to support challenge-led R&I with development impact within signature investment awards and programmes?

Summary

The factor with the strongest association with positive outputs or outcomes was collaboration with three or more non-academic partners in programme design and implementation. Being a signature programme award also increased the probability of reporting three or more positive outcomes.

Although collaboration with non-academic partners and inclusion in signature programmes are both associated with increased reporting of positive outputs and outcomes, the signature programmes themselves were less likely to be collaborative in design than other GCRF programmes.

The analysis identified key structures which increased the probability of reporting positive outputs, including a strategy framework, a ToC, a dissemination plan, and a gender & inclusion plan.

Key processes which increased the likelihood of reporting positive outputs included undergoing an evaluation, supporting research dissemination and support to obtain additional funding.

The regression analysis first investigated hypotheses 1.2 and 1.4, which postulate that MEL structures and collaboration in design lead to more positive outputs and outcomes. Signature investments are assumed to have more robust MEL structures in this hypothesis. The EQ 1 hypotheses are set out below.

EQ 1 Assumption: GCRF programmes are defined, set up and managed effectively by POs to support challenge led R&I with development impact

Sub-hypothesis 1.1: Signature investment management processes make a difference to research/ODA excellence compared to other programmes.

Sub-hypothesis 1.2: Programmes with MEL structures produce more outputs/better outcomes.

EQ 1 Assumption: Programmes are designed and implemented to ensure R&I with development impact

Sub-hypothesis 1.3: GCRF programmes and programme designs are generally inclusive (or collaborative) to varying degrees across countries and programmes.

Sub-hypothesis 1.4: More inclusion in design of programmes results in increased participation throughout award length, more relevant outcomes and stronger positioning for use of outputs.

To test the EQ 1 hypotheses, this subsection looks at the associations between GCRF processes and structures, and at the probability of reporting positive outcomes or outputs. 0 and Table 15: show the list of possible outputs and outcomes award holders could report.

Table 14: Outputs included in the GCRF award holder survey

Outputs included in the award holder survey
Chapter in a peer-reviewed book or edited volume published
Dissemination workshop or policy forum held with decision makers
Editorials/op-eds published
Intellectual property rights protection received (patent approved, trademark approved, etc.)
Joint venture agreement reached
Licencing arrangement agreed (for transfer of knowledge/technology)
New flora or fauna breed/variety
New protocol, technique or way of doing things developed
New research centre established
New research group or network has been set up
New software or technical product developed
Other media or creative content (e.g. interviews, blogs, podcasts, TED talks, films, exhibitions, educational art content, etc.)
Peer-reviewed book or edited volume published
Peer-reviewed journal article published
Policy change/societal impact at either the organisational/institutional, local, national or international level
Policy statement or issues paper published
Spin-out or start-up company/enterprise formed to exploit intellectual property
Technical report published

Table 15: Outcomes included in the GCRF award holder survey

Outcomes included in the award holder survey
The project has contributed to new or significantly improved management practice, knowledge, research findings, technology, methods, tools
The project has contributed to new or significantly improved and sustainable R&I partnerships across geographies and disciplines/sectors
The project has contributed to new or significantly improved capabilities (skills & infrastructure) in the United Kingdom
The project has contributed to new or significantly improved capabilities (skills & infrastructure) in the project's target country/countries
The project has contributed to new or significantly improved stakeholder networks across research, policy, practice, civil society & enterprise in the United Kingdom
The project has contributed to new or significantly improved stakeholder networks across research, policy, practice, civil society & enterprise in the project's target country/countries
The project has contributed to new or significantly improved commercial products and/or services, job creation, businesses, spin-off companies

The regression analysis seeks to isolate what impact different characteristics had on the probability of award holders responding that they had three or more outcomes or outputs, when controlling for other factors such as award size and award duration. The results of the analysis are shown in tables throughout this section of the report.

For example, **Error! Reference source not found.** shows the impact of key variables on the probability of reporting three or more positive outcomes and three or more positive outputs. The 'significance of difference' column shows how significant this effect is – asterisks and bold text indicate a statistically significant difference. For example, projects that were part of a signature programme were significantly more likely to report three or more positive outcomes. This means we can be confident that projects which are part of signature programmes report more positive outcomes from their work. Differences without bold text and asterisks are not statistically significant. For instance, the difference between involving and not involving the respondent in design is not significant; we cannot claim that the two estimates are different.

Table 16: Variables affecting the likelihood of achieving three or more positive outcomes and outputs

	Three or more positive outcomes		Three or more positive outputs	
	Probability	Significance of difference	Probability	Significance of difference
All respondents	0.855	-	0.574	-
Non-signature programmes	0.864	0.057**	0.570	0.077
Signature programmes	0.921		0.647	
2 or fewer non-academic collaborators in design	0.786	0.118***	0.426	0.229***

3 or more non-academic collaborators in design	0.904		0.654	
Respondent not involved in design	0.866	0.008	0.555	0.027
Respondent involved in design	0.874		0.582	
N=2,773				

Collaboration with three or more non-academic partners emerged as the factor with the strongest association with reporting three or more positive outputs or outcomes. Programmes collaborating with three or more non-academic partners were associated with a 90.4% probability of having three or more positive outcomes, compared to a 78.6% probability for those with fewer non-academic collaborators in design. The difference is 11.8 pp, suggesting a strong positive association between non-academic collaboration and outcomes. Programmes with collaboration with three or more non-academic partners were associated with a 65.4% probability of having three or more positive outputs, compared to a 42.6% probability for those with fewer non-academic collaborators in design. The difference is 22.9 pp and suggests a very strong positive association between non-academic collaboration and achieving three or more positive outputs.

There was no similar association, however, between awards with respondent involvement in design and the probability of achieving three or more positive outputs or outcomes. Neither of the associations is statistically significant. Neither variable, therefore, is likely to alter the probability of achieving three or more positive outcomes.

Signature programmes increased the probability of award holders reporting three or more positive outcomes compared to non-signature programmes. There was also a positive association with reporting three or more positive outputs, but this was not statistically significant. Signature programmes were associated with a 92.1% probability of the programme achieving our outcome of three or more positive outcomes, compared to 86.4% for non-signature programmes. The difference is 5.7 pp, and it suggests a strong positive association between signature programmes and achieving three or more positive outcomes.

Although collaboration with non-academic partners and signature programmes are both variables associated with increased reporting of positive outputs and outcomes, the signature programmes themselves were less likely to be collaborative in design. Signature programmes were less likely to be collaborative, with an 8.3 pp lower probability of collaboration in design with three or more non-academic partners than other GCRF programmes (see the final column in Table 17:). Statistically significant negative associations, such as external collaborators, are shown as negative values, with bold text and asterisks. It is surprising to have found them, as signature investments tended to prioritise partnerships with a strong focus on equity. However, the signature investment awards also tended to be large and complicated, with many international partners and longer time frames for working agreements to become established. This suggests that, viewed from the perspective of non-PI respondents, **signature awards may not have offered as many opportunities to contribute to the design in early phases of the award as other types of grant.**

Table 17: Signature and non-signature programme association with collaboration variables

	[1] Collaborative programme		[2] Non-PI involved in design		[3] Three or more external collaborators	
	Probability	Significance of difference	Probability	Significance of difference	Probability	Significance of difference

Non-signature programmes	0.681	-0.096**	0.973	-0.005	0.687	-0.083*
Signature programmes	0.585		0.968		0.604	
N =	2,773		1,559		2,773	

Note: model [2] is fitted to a sub-sample of non-PI respondents.

The analysis then considered the impact of having key structures and support processes in place on the probability of achieving three or more positive outputs or outcomes. The strongest impacts appear to have been on the likelihood of awards reporting three or more positive outputs, with the most significant factors outlined below:

- key structures – Strategy framework (7.8% pp increase in probability of reporting three or more positive outputs), ToC (7.5%), dissemination plan (9.4%), gender and inclusion plan (5.7%)
- support processes – networking opportunities (7.4%), dissemination of outputs (10.7%), support for additional funding (8.5%), support of no-cost extension (6.3%)
- MEL processes – evaluation took place (11.6%)
- collaboration – more than three non-academic partners (15.3%).

There were also positive associations between some of these structures and processes and the probability of achieving three or more positive outcomes, although the effect observed was smaller:

- key structures – Strategy framework (3.8%), defined targets (3.4%)
- support processes – support with programme implementation (2.7%), communication and dissemination of outputs (3.6%), support for additional funding (5.5%)
- MEL – evaluation took place (3.0%)
- collaboration – more than three non-academic partners (7.2%).

No plans or structures were associated with not achieving three or more positive outcomes and outputs, suggesting that none of the plans and support measured were harmful to programmes.

The impact of collaboration with non-academic partners is maintained when controlling for all support and plans within the programme. Table 18: gives a full breakdown of each variable tested, their percentage probability of having been achieved, and the strength of the associations.

Table 18: Probability of achieving three or more positive outcomes and outputs by key structures and support processes

Key structures and support processes	[3] Three or more positive outcomes		[4] Three or more positive outputs	
	Probability	Significance of difference	Probability	Significance of difference
Key Structures				
No strategy/framework	0.867	0.038***	0.547	0.078***
Strategy/framework	0.905		0.625	
No ToC/Pathway to Impact/Impact Strategy	0.892	-0.004	0.543	0.075***
ToC/Pathway to Impact/Impact Strategy	0.888		0.618	
No defined mission statement/vision	0.890	-0.001	0.580	0.023

Defined mission statement/vision	0.889		0.603	
No clearly defined objectives linked to development goals	0.865	0.034**	0.567	0.034
Clearly defined objectives linked to development goals	0.899		0.601	
No oversight committee or similar = 0, No	0.887	0.009	0.591	0.001
Oversight committee or similar	0.896		0.592	
No research and/or innovation implementation plan	0.891	-0.002	0.581	0.015
Research and/or innovation implementation plan	0.889		0.596	
No communication/dissemination plan for outputs	0.883	0.009	0.522	0.094***
Communication/dissemination plan for outputs	0.892		0.616	
No gender and inclusion plan	0.882	0.019	0.569	0.057**
Gender and inclusion plan	0.901		0.626	
Support received				
No technical research advice received	0.882	0.024	0.586	0.017
Technical research advice received	0.906		0.603	
No support with research design received	0.896	-0.023	0.588	0.009
Support with research design received	0.873		0.598	
No support with programme implementation received	0.879	0.027*	0.594	-0.008
Support with programme implementation received	0.906		0.586	
No gender and inclusion expert advice received	0.887	0.020	0.592	-0.004
Gender and inclusion expert advice received	0.907		0.588	
No networking opportunities shared	0.879	0.021	0.554	0.074***
Networking opportunities shared	0.900		0.627	
No support with communication/dissemination of programme outputs	0.874	0.036***	0.546	0.107***
Support with communication/dissemination of programme outputs	0.910		0.653	
No support for pursuing additional funding	0.873	0.055***	0.568	0.085***
Support for pursuing additional funding	0.927		0.653	
No support for no-cost grant extension	0.889	0.001	0.563	0.063***
Support for no-cost grant extension	0.890		0.626	
MEL structures				
Not subject to evaluation	0.879	0.030**	0.553	0.116***
Subject to evaluation	0.909		0.668	
Components of collaboration				
Respondent not involved in design	0.899	-0.010	0.608	-0.018
Respondent involved in design	0.889		0.591	
2 or fewer non-academic collaborators in design	0.837		0.487	0.153***

3 or more non-academic collaborators in design	0.910	0.072***	0.640	
0.855-0.574 average with 3 or more positive outcomes/ outputs	0.867		0.547	
Number of responses		2,773		2,773

EQ 1: Key takeaways

Projects that were part of a signature programme were significantly more likely to report three or more positive outcomes (92.1% probability, 5.7 pp higher than non-signature programmes).

Collaboration with three or more non-academic partners emerged as the factor with the strongest association with reporting three or more positive outputs or outcomes (90.4% probability).

However, signature awards may not have offered as many opportunities to contribute to the design in early phases of the award as other types of grant.

Many key structures and support processes showed a positive and significant influence of achieving three or more positive outputs and outcomes, including strategy framework, support for additional funding, an evaluation taking place, and more than three non-academic partners.

5.2 EQ 2 regression analysis: To what extent are structures and processes in place to strengthen R&I capacity in LMICs and the UK?

Summary

After controlling for factors such as award size and duration, being a signature programme increased the probability of reporting improved capacity to secure future funding, both for LMIC and UK respondents. Improved R&I partnerships were more likely to be reported by UK respondents.

Collaboration in design with three or more non-academic partners is positively associated with increased probabilities of all dimensions of capacity building, with particularly strong impacts on partnership and capacity to apply for further funding.

Being a signature programme did not affect the likelihood of LMIC respondents reporting improved connections to UK and global networks or to improved R&I skills and infrastructure in their countries.

The EQ 2 regression analysis investigated the factors which increased the probability of survey respondents reporting positive capacity building impacts, with differences noted between signature

and non-signature respondents and between LMIC and UK respondents. The EQ 2 hypotheses are shown below.

EQ 2 Assumption:

Structures and processes strengthen and build R&I capacity (in LMICs and UK)

Sub-hypothesis 2.1: Primary and or/secondary award holders receive support/leadership/guidance/information from GCRF (e.g. Challenge Leaders, mentoring, etc.)

Sub-hypothesis 2.2: LMIC based award holders are connected to global and UK R&I networks through structures created through GCRF awards

Sub-hypothesis 2.3: LMIC based award holders receive exposure to R&I infrastructure/technology and knowledge

Sub-hypothesis 2.4: UK based award holders collaborate more with LMIC researchers resulting in innovative, LMIC relevant outputs/outcomes

Sub-hypothesis 2.5: GCRF funding builds capacity for award holders to apply for further funding (through GCRF or elsewhere)

Sub-hypothesis 2.6: GCRF programme and programme designs are generally inclusive (collaborative) to varying degrees across countries and programmes.

Sub-hypothesis 2.7: More inclusion (collaboration) in design of programmes results in increased participation throughout award length, more relevant outcomes and stronger positioning for use of outputs.

Holding an award from a signature programme increased the probability of reporting improved capacity to secure future funding, both for LMIC and UK respondents. Improved R&I partnerships were more likely to be reported by UK respondents only. Signature programmes were positively associated with a 5.2 pp increase in the probability of improved R&I partnerships (UK respondents only) and a 7.3 pp increase in the probability of future capacity to obtain funding (all respondents).

Collaboration in design with three or more non-academic partners is positively associated with increased probabilities of all the dimensions of capacity building surveyed, with particularly strong impacts on partnership and capacity to apply for further funding. For all respondents, the data suggests an increase of 7.8 pp in the probability of achieving improved R&I partnerships and an increase of 13.4 pp in the probability of achieving improved capacity for applying for further funding. LMIC respondents reported around 4.8–7.4 pp in achieving improved connections to UK and global networks and improved R&I skills and infrastructure in their countries. For UK respondents, the data suggests an increase of 8.8 pp in achieving improved R&I partnerships.

Being a signature programme did not appear to have an effect on the likelihood of LMIC respondents reporting improved connections to UK and global networks or improved R&I skills

and infrastructure in their countries. There was also no significant impact on partnerships arising from holding a signature programme award. There was no statistical association in either direction between signature programmes and improved connections to networks, improved skills and infrastructure, or improved R&I partnerships. A full breakdown of data is shown in Table 19:.

Table 19: Analysis of variables affecting improved capabilities

	[1] Sub-hypothesis 2.1: Connection to UK and global networks – LMIC respondents only		[2] Sub-hypothesis 2.2: Improved capabilities (skills and infrastructure) – LMIC respondents only		[3] Sub-hypothesis 2.3: Improved R&I partnerships across geographies or disciplines		[4] Sub-hypothesis 2.4: Improved R&I partnerships across geographies or disciplines – UK respondents only		[5] Sub-hypothesis 2.5: Capacity to apply for further funding	
	Prob- ability	Significance of difference	Prob- ability	Significance of difference	Prob- ability	Significance of difference	Prob- ability	Significance of difference	Prob- ability	Significance of difference
Non-signature programme	0.938	-0.013	0.906	0.019	0.891	0.000	0.873	0.052*	0.349	0.073*
Signature programme	0.925		0.925		0.891		0.925		0.422	
2 or fewer non-academic collaborators in design	0.877	0.074***	0.873	0.048**	0.833	0.078***	0.817	0.089***	0.272	0.134***
3 or more non-academic collaborators in design	0.951		0.921		0.911		0.905		0.406	
Respondent not involved in design	0.936	0.000	0.873	0.037	0.901	-0.011	0.880	0.001	0.257	0.105*
Respondent involved in design	0.936		0.910		0.891		0.881		0.362	
N=	1,025		1,071		2,533		1,434		2,766	

EQ 2: Key takeaways

Signature programmes were 7.3 pp more likely to report improved capacity to secure future funding.

Collaborating with three or more non-academic partners was associated with increases in all dimensions of capacity building, particularly improved R&I partnerships.

5.3 EQ 3 regression analysis: To what extent are processes to support challenge-led research efficiently implemented? Are they proportionate for UK and LMIC stakeholders, are they timely and do they offer value for money?

Summary

Perceptions of funding sufficiency and timeliness were consistent across signature and non-signature programmes. LMIC respondents, however, were more likely to find the level of funding sufficient than were their UK counterparts.

Programmes that included collaboration with three or more non-academic partners increased the probability of success in obtaining further funding. This finding holds for both LMIC and UK respondents. LMIC respondents who were involved in the design of projects were slightly more likely to report success in obtaining further funding.

Including three or more non-academic collaborators had a strong positive impact on all three dimensions of fairness – opportunity, process, and benefit sharing.

All measures of fairness significantly increased the likelihood of reporting three or more positive outputs and outcomes. Measures of fairness likewise increased the likelihood of reporting three or more positive outputs, with fairness of benefit sharing showing the largest impact.

The EQ 3 regression analysis investigates the factors that increased the probability of survey respondents perceiving GCRF funding as timely and sufficient. Fairness of opportunity, process and benefit are also considered, with differences between LMIC and UK respondents explored. The associations between improved fairness and positive results are examined. The hypotheses used are shown below.

EQ 3 Assumption: Processes and structures are efficient, timely, proportionate and fair

Sub-hypothesis 3.1: GCRF funding catalyses R&I in various thematic areas.

Sub-hypothesis 3.2: GCRF funding stimulates other funding opportunities.

Sub-hypothesis 3.3: The majority of GCRF funding is sufficient and timely to deliver.

Sub-hypothesis 3.4: GCRF research funding supports fairness of opportunity (before research), fairness of process (during research implementation) and fairness of benefit sharing (after the award).

5.3.1 Funding sufficiency and timeliness

Regression analysis shows that the findings around funding sufficiency and timeliness remain the same across signature and non-signature programmes and for awards which included collaboration with three or more non-academic partners. LMIC respondents, however, were more likely to find the level of funding sufficient.

For LMIC respondents, the association is positive and strong, leading to a 9.6 pp increase in the probability of reporting funding sufficiency. There were no statistical associations between the

variables measuring collaboration for funding sufficiency; neither signature programmes nor collaborative programmes were associated with funding timeliness.⁹

5.3.2 Obtaining further funding

Awards that included collaboration with three or more non-academic partners increased the probability of success in obtaining further funding. This finding holds for both LMIC and UK respondents, suggesting that the positive impacts of collaboration on further funding are felt in an equitable way (see Table 20:).

An award with three or more non-academic collaborators is associated with a 9.3 pp increase in the probability of agreeing that there have been successful funding applications because of the programme. Awards with three or more non-academic collaborators have a strong positive association for both LMIC (6.0 pp) and UK (11.3 pp) respondents in increasing the probability of reporting success in funding because of this programme.

LMIC respondents who were involved in the design of projects were slightly more likely to report success in obtaining further funding. This suggests that collaboration of this kind could contribute to improved capacity in designing research proposals. Being involved in the design had a strong positive association for LMIC respondents, but not for UK respondents, in funding success. The difference is not statistically significant, however. Signature programmes and survey respondents' involvement in the design did not increase the likelihood of successfully obtaining funding because of the award.

⁹ A full table of these variables is available on request.

Table 20: Analysis of UK and LMIC-based respondents' success in obtaining further funding

	Probability	Significance of difference	Subgroup signature	Subgroup collaborators	Subgroup involved in the design
Non-signature programmes	0.257	-0.010			
Signature programmes	0.247				
2 or fewer non-academic collaborators in design	0.196	0.093***			
3 or more non-academic collaborators in design	0.289				
Respondent not involved in design	0.182	0.076			
Respondent involved in design	0.258				
Respondent from LMIC	0.243				
Respondent from UK	0.275				
Differential subgroup – UK respondents			-0.046	0.113***	0.042
Differential subgroup – LMIC respondents			0.050	0.060*	0.123*
Non-signature & UK respondents	0.250				
Non-signature & LMIC respondents	0.268				
Signature & UK respondents	0.203				
Signature & LMIC respondents	0.318				
2 or fewer non-academic collaboration & UK respondents	0.172				
2 or fewer non-academic collaboration & LMIC respondents	0.235				
3 or more non-academic collaboration & UK respondents	0.285				
3 or more non-academic collaboration & LMIC respondents	0.295				
Not involved in design & UK respondents	0.202				
Not involved in design & LMIC respondents	0.156				
Involved in design & UK respondents	0.244				
Involved in design & LMIC respondents	0.279				
N=	2,696	2,696	2,696	2,696	2,696

Note: 'subgroup' columns indicate the differential association between the subgroup specified and LMIC and UK-based respondents, i.e. to determine if the subgroup has a different association for the UK and LMIC respondents.

5.3.3 Fairness

As with funding timeliness and sufficiency, including three or more non-academic collaborators had a strong positive impact on fairness. Respondents involved in a collaborative programme were significantly more likely to report fairness across all three dimensions – opportunity, process and benefit sharing. Having non-academic collaboration in design increased the probability of reporting fairness of opportunity by 6.3 pp. If there was collaboration with three or more non-academic partners, there was a 16.4 pp increase in the probability of reporting fairness in process and a 16.8 pp increase in the probability of reporting fairness of benefit sharing. This association holds across both LMIC and UK respondents, though with greater likelihood of fairness of process being reported by LMIC respondents (19.7 pp) than by UK respondents (11.9 pp).

Signature programmes are not strongly statistically associated with any of the measures of fairness. Table 21:–Table 24: estimate the difference in the association of signature programmes, non-academic collaboration and involvement in design by LMIC-based respondents and UK-based respondents concerning fairness measures.

All measures of fairness significantly increased the likelihood of reporting three or more positive outcomes. The strongest impact comes from fairness in benefit sharing, which is associated with a 12.8 pp increase in the probability of three or more positive outcomes after controlling for all other measures. All other dimensions also increase the likelihood of reporting three or more positive outcomes by between 8.5 pp and 15.4 pp (see Table 23:). Fairness measures higher probabilities of achieving three or more positive outcomes.

The presence of indicators of fairness likewise increased the likelihood of reporting three or more positive outputs, with fairness of benefit sharing showing the largest impact. Fairness of benefit sharing is associated with a 15.5 pp increase, whereas fairness in process has an association of only 7.4 pp. Fairness of process and fairness of opportunity are only associated with achieving three or more positive outputs when included alone but not when all measures are included, implying that they are strongly correlated with other measures of fairness and have only a small impact individually. All other fairness measures are positively associated with reporting three or more positive outputs.

Table 21: Analysis of UK and LMIC-based respondents’ perceptions of fairness

	[1] Fairness in opportunity					[2] Fairness in process				
	Prob-ability	Significance of difference	Subgroup signature	Subgroup collaborators	Subgroup involved in the design	Prob-ability	Significance of difference	Subgroup signature	Subgroup collaborators	Subgroup involved in the design
Non-signature programmes	0.649	0.005				0.555	0.005			
Signature programmes	0.655					0.560				
2 or fewer non-academic collaborators in design	0.606	0.063***				0.440	0.164***			
3 or more non-academic collaborators in design	0.669					0.604				
Respondent not involved in design	0.646	0.004				0.668	-0.114			
Respondent involved in design	0.650					0.554				
Respondent from LMIC	0.610					0.552				
Respondent from UK	0.702					0.562				
Differential subgroup – UK respondents			-0.014	0.054*	0.017			0.057	0.197***	-0.102
Differential subgroup – LMIC respondents			0.028	0.073**	-0.012			-0.064	0.119***	-0.130
Non-signature & UK respondents	0.612					0.544				
Non-signature & LMIC respondents	0.699					0.570				
Signature & UK respondents	0.598					0.600				
Signature & LMIC respondents	0.726					0.506				
2 or fewer non-academic collaboration & UK respondents	0.572					0.413				
3 or more non-academic collaboration & LMIC respondents	0.652					0.477				
3 or more non-academic collaboration & UK respondents	0.627					0.610				
3 or more non-academic collaboration & LMIC respondents	0.724					0.597				
Not involved in design & UK respondents	0.593					0.652				
Not involved in design & LMIC respondents	0.714					0.689				
Involved in design & UK respondents	0.610					0.550				
Involved in design & LMIC respondents	0.702					0.559				
N=	2,539	2,539	2,539	2,539	2,539	2,283	2,283	2,283	2,283	2,283

Table 22: Analysis of UK and LMIC-based respondents’ perceptions of fairness

	[3] Fairness in benefits				
	Probability	Significance of difference	Subgroup signature	Subgroup collaborators	Subgroup involved in the design
Non-signature programmes	0.577	0.036			
Signature programmes	0.613				
2 or fewer non-academic collaborators in design	0.463	0.168***			
3 or more non-academic collaborators in design	0.631				
Respondent not involved in design	0.662	-0.082			
Respondent involved in design	0.580				
Respondent from LMIC	0.571				
Respondent from UK	0.597				
Differential subgroup – UK respondents			0.083	0.185***	-0.129
Differential subgroup – LMIC respondents			-0.028	0.145***	-0.015
Non-signature & UK respondents	0.559				
Non-signature & LMIC respondents	0.600				
Signature & UK respondents	0.642				
Signature & LMIC respondents	0.572				
2 or fewer non-academic collaboration & UK respondents	0.440				
2 or fewer non-academic collaboration & LMIC respondents	0.494				
3 or more non-academic collaboration & UK respondents	0.625				
3 or more non-academic collaboration & LMIC respondents	0.639				
Not involved in design & UK respondents	0.697				
Not involved in design & LMIC respondents	0.611				
Involved in design & UK respondents	0.568				
Involved in design & LMIC respondents	0.596				
N=	2,267	2,267	2,267	2,267	2,267

Table 23: Analysis of fairness and gender and inclusion variables on probability of achieving three or more outcomes or three of more outputs

	[1] Three or more positive outcomes	[2]	[3]	[4]	[5]	[6]
	Probability	Significance of difference	Significance of difference	Significance of difference	Significance of difference	Significance of difference
Fairness of opportunity = 0, No	0.910	0.025**	0.101***			
Fairness of opportunity = 1, Yes	0.935					
Fairness of process = 0, No	0.910	0.028**		0.085***		
Fairness of process = 1, Yes	0.939					
Fairness of benefit sharing = 0, No	0.834	0.128***			0.154***	
Fairness of benefit sharing = 1, Yes	0.962					
Gender and inclusion plan = 0, No	0.920	0.016			0.067***	
Gender and inclusion plan = 1, Yes	0.937					
Gender and inclusion expert advice = 0, No	0.924	0.020				0.088***
Gender and inclusion expert advice = 1, Yes	0.944					
N=	2,068	2,068	2,544	2,288	2,267	2,703

Note: Column [1] shows the probability of three or more positive outcomes after controlling for all other measures. Columns [2]–[6] show the probability of each covariate alone.

Table 24: Analysis of fairness and gender and inclusions variables on probability of achieving three or more outcomes or three of more outputs

	[2] Three or more positive outputs	[2]	[3]	[4]	[5]	[6]
	Probability	Significance of difference	Significance of difference	Significance of difference	Significance of difference	Significance of difference
Fairness of opportunity = 0, No	0.636	-0.026	0.037*			
Fairness of opportunity = 1, Yes	0.610					
Fairness of process = 0, No	0.597	0.040		0.074***		
Fairness of process = 1, Yes	0.636					
Fairness of benefit sharing = 0, No	0.549	0.118***			0.155***	
Fairness of benefit sharing = 1, Yes	0.667					
Gender and inclusion plan = 0, No	0.562	0.134***			0.178***	
Gender and inclusion plan = 1, Yes	0.696					
Gender and inclusion expert advice = 0, No	0.604	0.098***				0.189***
Gender and inclusion expert advice = 1, Yes	0.703					
N=	2,068	2,068	2,544	2,288	2,267	2,703

Note: Column 1 shows the probability of three or more positive outcomes after controlling for all other measures. Columns 2-6 show the probability of each covariate alone.

EQ 3: Key takeaways
Programmes that included collaboration with three or more non-academic partners were 9.3 pp more likely to obtain further funding and were also significantly more likely to report fairness of opportunity, process, and benefit sharing.
LMIC respondents who were involved in the design of projects were more likely to report success in obtaining further funding, suggesting that such collaborations could contribute to improved capacity.
All measures of fairness significantly increased the likelihood of reporting three or more positive outcomes (by between 8.5 pp and 15.4 pp) and three or more positive outputs (by between 7.4 pp and 15.5 pp).

5.4 EQ 4 regression analysis: To what extent have the signature programmes made early progress towards their desired outcomes/impacts, and what evidence exists of these?

Summary

Signature programmes emerged clearly from the analysis as more likely to produce a wider range of R&I outputs and to reach a wide range of different stakeholders than non-signature programmes. Reported use by policymakers was particularly strong in comparison to non-signature programmes.

For both signature and non-signature award-holders, private sector stakeholders in both the UK and LMICs emerged as the least likely to use GCRF research.

Collaboration with three or more non-academic partners again emerged as a key influence on progress towards results. This variable increased the likelihood of achieving more positive outputs and of seeing improved partnerships and networks.

The EQ 4 regression analysis investigates the factors that increased the probability of award holders reporting a range of R&I outputs and the extent to which these reached different stakeholders. The hypotheses used are shown below.

EQ 4 Assumption: Evidence of early progress towards desired outcomes exist (both positive and negative)

Sub-hypothesis 4.1: Challenge-led, practical R&I outputs are increasing in the UK and Global South due to GCRF funding.

Sub-hypothesis 4.2: GCRF funding has catalysed new networks – sectoral, multisectoral and interdisciplinary – globally and with the UK.

Sub-hypothesis 4.3: There is evidence of GCRF-supported R&I being utilised by stakeholders in a range of processes, including policy, planning and programming, business, enterprise and investments.

Signature programmes emerged clearly from the analysis as more likely to produce a range of R&I outputs and to reach a wide range of different stakeholders. Use by policymakers was particularly strong in comparison to non-signature programmes (see Table 25:). Signature programmes produced a more comprehensive range of outputs – on average, one more than non-signature programmes. Signature award holders also reported more use by policymakers at international, national and subnational levels, and by multilateral organisations, than non-signature award holders. On average, respondents from signature programmes reported around 0.5 more users of programme information than non-signature programmes. Although research and academic users were most commonly reported across all respondents, non-signature award holders were more likely to give this answer. This suggests that use was more concentrated in academia in non-signature awards and that signature awards tended to reach a broader audience.

Table 25: Users of research outputs by signature and non-signature programme

Type of stakeholder	All signature respondents		All non-signature respondents	
	N	%	N	%
International policymakers	139	26%	413	14%

National policymakers	244	46%	873	30%
Subnational policymakers	185	35%	703	24%
Multilateral organisations (e.g. United Nations, World Bank)	119	23%	331	11%
UK non-governmental institutions/civil society	64	12%	232	8%
Non-governmental institutions/civil society in LMICs	167	32%	854	29%
UK private sector	24	5%	131	4%
Private sector in LMICs	63	12%	320	11%
Academics and researchers	297	57%	2,036	69%
Local communities	211	40%	1,093	37%
None	58	11%	529	18%

For both signature and non-signature award holders, private sector stakeholders in both the UK and LMICs emerged as the least likely to use GCRF research. This echoes the earlier finding that programmes across GCRF’s portfolio have not produced high levels of commercial products and/or services, job creation, businesses or spin-off companies.

Collaboration with three or more non-academic partners again emerged as a key influence on progress towards results. This variable increased the likelihood of achieving more positive outputs and of seeing improved partnerships and networks (see Table 26:). Awards with three or more non-academic partners consulted in design were more likely to report a larger number of outputs in total. Awards with three or more non-academic partners consulted in design are associated with a 22.9 pp increase in the probability of three or more outputs and, on average, an additional 1.2 additional outputs more than those programmes with fewer non-academic consultations. The same variable was positively associated with building improved networks or partnerships. There was an 8.3 pp increase in the probability of achieving this outcome if the programme had three or more non-academic partners. Signature programmes are positively associated with the likelihood of reporting improved networks or partnerships, but only by 3.7 pp.

Table 26: Analysis of impact of key variables on the probability of achieving positive results

	[1] Sub-hypothesis 4.1: Has 3 or more positive outputs		[2] Sub-hypothesis 4.1: The number of positive outputs		[3] Sub-hypothesis 4.2: Improved R&I partnerships or improved connections to global and UK networks	
	Probability	Significance of difference	Probability	Significance of difference	Probability	Significance of difference
Non-signature programmes	0.570	0.077	3.140	0.392	0.914	0.038*
Signature programmes	0.647		3.530		0.952	
2 or fewer non-	0.426	0.229***	2.430	1.220***	0.859	0.083***

academic collaborators in design						
3 or more non-academic collaborators in design	0.654		3.650		0.941	
Respondent not involved in design	0.555	0.027	2.890	0.309	0.868	0.054
Respondent involved in design	0.582		3.200		0.922	
N=	2,773	2,773	2,773	2,773	2,773	2,773

Note: Model [2] uses negative binomial regress to estimate the difference in the count of outputs achieved. **Error! Reference source not found.**

Similarly, collaboration with three or more non-academic partners in design was strongly associated with higher reported levels of all users of evidence (see Table 27:). It is likely that many of those who contributed to the design are invested in the programme and have been able to contribute to ensuring that it meets their needs and those of other key stakeholders. The three types of stakeholder whose inclusion had the most significant impact on use of evidence were:

- NGO stakeholders – 23.8 pp increased probability
- community stakeholders – 22.8 pp increased probability
- any policymaker – 30.0 pp increased probability.

EQ 4: Key takeaways
Signature programmes were significantly more likely to produce a range of R&I outputs, to reach a wide range of different stakeholders, and to experience use by policymakers.
Private sector stakeholders in both the UK and LMICs were the least likely to use GCRF researchers. This confirms that GCRF programmes have not produced high levels of commercial products, services, job creation, or businesses.
Collaboration with three or more non-academic increased the likelihood of seeing improved partnerships and networks and higher reported levels of all users of evidence.

Table 27: Probability of different stakeholders using programme evidence

Panel A	[1] Two or more different groups utilised evidence		[2] Number of groups utilising evidence from programme		[3] NGOs using evidence		[4] Private sector using evidence		[5] Community using evidence	
	Probability	Significance of difference	Probability	Significance of difference	Probability	Significance of difference	Probability	Significance of difference	Probability	Significance of difference
Non-signature programmes	0.390	0.065	2.291	0.266	0.350	0.043	0.120	0.009	0.370	0.008
Signature programmes	0.450		2.557		0.390		0.130		0.380	
2 or fewer non-academic collaborators in design	0.210	0.296***	1.583	1.229***	0.210	0.238***	0.080	0.067**	0.220	0.228***
3 or more non-academic collaborators in design	0.500		2.813		0.440		0.140		0.450	
Respondent not involved in design	0.440	-0.046	2.399	-0.074	0.310	0.048	0.150	-0.038	0.400	-0.033
Respondent involved in design	0.390		2.325		0.360		0.120		0.370	
N=	2,773	2,773	2,773	2,773	2,773	2,773	2,747	2,747	2,773	2,773

Panel B	[6] Academia using evidence		[7] Any policymaker using evidence		[8] International policymakers using evidence		[9] National policymakers using evidence		[10] Sub-nation policymakers using evidence	
	Prob-ability	Significance of difference	Prob-ability	Significance of difference	Prob-ability	Significance of difference	Prob-ability	Significance of difference	Prob-ability	Significance of difference
Non-signature programmes	0.710	0.090***	0.420	0.096**	0.120	0.041	0.290	0.068	0.220	0.048
Signature programmes	0.800		0.510		0.160		0.360		0.270	
2 or fewer non-academic collaborators in design	0.660	0.093***	0.240	0.300***	0.070	0.109***	0.180	0.205***	0.110	0.202***
3 or more non-academic collaborators in design	0.750		0.540		0.170		0.380		0.310	
Respondent not involved in design	0.670	0.051	0.440	-0.012	0.190	-0.064	0.320	-0.018	0.290	-0.062
Respondent involved in design	0.720		0.430		0.130		0.300		0.230	
N=	2,773	2,773	2,773	2,773	2,773	2,773	2,773	2,773	2,773	2,773

5.5 EQ 5 regression analysis: What particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes in different contexts?

Summary

Programmes in LICs were significantly more likely to report barriers than programmes located only in HICs.

Disruption arising from the ODA budget reductions that affected GCRF budgets significantly increased the likelihood of respondents reporting barriers. Disruption related to Covid also emerged as a lesser barrier.

Programmes which included three or more non-academic collaborators in design were more likely to report a higher number of barriers.

All types of barrier, except for physical geography challenges, decreased the likelihood of reporting three or more positive outcomes by a small but statistically significant amount. A lack of financial or technical support was more likely to impact LMIC respondents.

The EQ 5 regression analysis explored the impact of a range of variables on the likelihood of reporting barriers: collaboration, location of respondent, experiences of funding cuts and Covid-19, and signature and non-signature programmes. The EQ 5 assumption is set out below.

EQ 5 Assumption: Structural and contextual factors will shape outcomes

Sub-hypothesis 5.1: Structural and contextual barriers to carry out GCRF programmes are greater in LICs than in MICs.

Table 28: gives a full breakdown of the variables affecting the probability of experiencing barriers.

A programme's location made a significant difference to the probability of experiencing barriers. Programmes in LICs were 10.9 pp more likely to report barriers, experiencing, on average, 0.28 more than programmes located only in HICs. Respondents in lower middle-income countries were 6.4 pp less likely to report barriers and suffered 0.16 fewer barriers than those in HICs. Those in upper middle-income countries were likely to report 0.20 more barriers than those from HICs.

Disruption arising from cuts to GCRF budgets also significantly increased the likelihood of respondents reporting barriers. Disruption related to Covid likewise emerged as a barrier, although to a lesser extent. Budget cuts increased the probability of experiencing at least two barriers by 8.6 pp and, on average, increased the number of barriers reported by 0.29. This rose to a 19 pp increase and 0.67 more barriers for those programmes where funding ceased altogether, compared to programmes with no disruption. Covid disruption increases the probability of at least two barriers by 5.0 pp and, on average, 0.16 more than those without Covid disruption.

Programmes which included three or more non-academic collaborators in design were more likely to report a higher number of barriers. These programmes had a 5.4 pp increase in the probability of experiencing at least two moderate barriers and, on average, experienced 0.21 more barriers than programmes with fewer than three non-academic collaborators. Given that the baseline probability of two or more moderate barriers is 33.5%, with an average of 1.18 barriers felt per programme, this

is a large increase. This suggests that working in a consortium poses additional challenges to award holders, although the positive findings on the importance of collaboration for outcomes suggests that it is worthwhile to make the effort to overcome these challenges.

There was no significant difference between signature and non-signature programmes re either the likelihood or the number of barriers reported. Signature programmes are not statistically associated with barriers reported, with point estimates showing only a 2 pp decrease in the probability of reporting barriers or a reduction of 0.06 moderate barriers felt. Signature programmes had no association with the occurrence of any specific barriers individually.

Table 28: Analysis of variables affecting the probability of experiencing barriers

	[1] At least two moderate barriers felt in the programme		[2] Count of at least moderate barriers (maximum five)	
	Probability	Significance of difference	Probability	Significance of difference
Non-signature programmes	0.330	-0.022	1.154	-0.065
Signature programmes	0.308		1.090	
2 or fewer non-academic collaborators in design	0.291	0.054***	1.008	0.211***
3 or more non-academic collaborators in design	0.345		1.219	
Respondent not involved in design	0.318	0.009	1.158	-0.013
Respondent involved in design	0.327		1.145	
No disruption from budget cuts	0.292	0.086***	1.034	0.286***
Some disruption from budget cuts				
Funding ceased due to budget cuts	0.378		1.320	
No disruption from Covid	0.483	0.191***	1.706	0.672***
Disruption from Covid				
Programme location: High-income	0.289	0.050**	1.031	0.155**
Programme location: Low-income	0.339		1.186	
Programme location: Lower middle-income	0.260	0.109**	0.935	0.281
Programme location: Upper middle-income	0.368		1.216	
Respondent location: High-income	0.322	0.062	1.124	0.189
Respondent location: Low-income	0.303	0.043	1.141	0.206
Respondent location: Lower middle-income	0.337	-0.054	1.156	-0.119
Respondent location: Upper middle-income	0.283		1.037	
Average of response variable	0.380	0.044	1.369	0.213**
N=	2,773	2,773	2,773	2,773

The analysis then explored the impact of the types of barriers experienced on the likelihood of reporting three or more positive outcomes. Table 29: gives a full breakdown of associations.

All types of barrier, except for physical geography challenges, decreased the likelihood of reporting three or more positive outcomes by a small but statistically significant amount. A lack of financial or technical support was more likely to impact LMIC respondents. A lack of financial or technical support was associated with a 2.9 pp lower probability of reaching three or more positive outcomes (model 1). Without accounting for correlation between barriers (model 2), this association shows a 4.8 pp lower probability. For LMIC respondents alone, there was a 4.9 pp lower probability of reaching three or more positive outcomes, rising to a 5.2 pp lower probability without correlating between barriers. Similarly, a lack of supportive organisational environment is associated with a 3.4 pp lower probability of achieving three positive outcomes (model 1), rising to 5.2 pp when testing this covariate alone (model 3). A lack of equipment and/or professional capacity for data collection and analysis is associated with a 3.5 pp lower probability of achieving three or more positive outcomes when in the model alone. All difference values are fairly low given the high overall level of probabilities.

EQ 5: Key takeaways
Programmes in LICs were 10.9 pp more likely to report barriers, experiencing, on average, 0.28 more than programmes located only in HICs.
Disruption arising from cuts to GCRF budgets also significantly increased the likelihood of respondents reporting barriers. Disruption related to Covid likewise emerged as a barrier.
Programmes which included three or more non-academic collaborators in design were more likely to report a higher number of barriers. This suggests that there are challenges involved in working in a consortium, despite the importance of collaboration for outcomes and outputs.
All types of barrier, except for physical geography challenges, decreased the likelihood of reporting three or more positive outcomes by a small but statistically significant amount.

Table 29: Influence of perceived barriers on achieving three or more positive outcomes for all respondents and LMIC respondents only

All respondents	[1] Three or more positive outcomes		[2]	[3]	[4]	[5]	[6]
	Probability	Significance of difference	Significance of difference	Significance of difference	Significance of difference	Significance of difference	Significance of difference
No lack of financial and technical support	0.882	-0.029**	-0.048***				
Lack of financial and technical support	0.853						
No lack of supportive organisational environment	0.881	-0.034**		-0.052***			
Lack of supportive organisational environment	0.846						
No political, governance and security challenges	0.869	-0.004			-0.024*		
Political, governance and security challenges	0.865						
No physical geography challenges	0.859	0.013				-0.012	
Physical geography challenges	0.872						
No lack of equipment/professional capacity for data collection and analysis	0.874	-0.015					-0.035***
Lack of equipment/professional capacity for data collection and analysis	0.859						
N=	2,773	2,773	2,773	2,773	2,773	2,773	2,773

Table 30: Influence of perceived barriers on achieving three or more positive outcomes for all respondents and LMIC respondents only

LMIC respondents	[1] Three or more positive outcomes		[2]	[3]	[4]	[5]	[6]
	Probability	Significance of difference	Significance of difference	Significance of difference	Significance of difference	Significance of difference	Significance of difference
No lack of financial and technical support	0.902	-0.049**	-0.052***				
Lack of financial and technical support	0.853						
No lack of supportive organisational environment	0.885	-0.016		-0.033			
Lack of supportive organisational environment	0.869						
No political, governance and security challenges	0.865	0.021			-0.004		
Political, governance and security challenges	0.886						
No physical geography challenges	0.880	-0.005				-0.014	
Physical geography challenges	0.875						
No lack of equipment/professional capacity for data collection and analysis	0.877	0.001					-0.025
Lack of equipment/professional capacity for data collection and analysis	0.878						
N=	1,109	1,109	1,109	1,109	1,109	1,109	1,109

6 Findings and conclusions

EQ 1: To what extent are structures and processes in place to support challenge-led R&I with development impact within signature investment awards and programmes?

EQ 1: Key findings
Signature programme award holders reported higher levels of all the structures and processes included (e.g. ToC, mission statements, oversight committee) than non-signature programmes.
Signature programme award holders also reported higher levels of support, including networking opportunities, dissemination of outputs, and support with implementation.
Projects that were part of a signature programme were significantly more likely to report three or more positive outcomes (92.1% probability – 5.7 pp higher than non-signature programmes).
Collaboration with three or more non-academic partners emerged as the factor with the strongest association with reporting three or more positive outputs or outcomes (90.4% probability).
However, signature awards may not have offered as many opportunities to contribute to the design in early phases of the award as other types of grant.
Many key structures and support processes showed a positive and significant influence of achieving three or more positive outputs and outcomes, including strategy framework, support for additional funding, an evaluation taking place, and more than three non-academic partners.

GCRF's signature programmes were designed as large-scale, multi-partner, multidisciplinary initiatives, designed around the principles of equitable partnerships and stakeholder engagement to promote use. Therefore, it is not surprising that the awards from signature programmes reported higher levels of structures and processes than non-signature awards. Signature programmes also tended to offer more programmatic support than other GCRF calls, to help promote impact.

What we see from the regression analysis is that having specific structures in the award helps to promote outcomes, rather than adding bureaucracy. This may be because structures and processes are required to effectively mobilise multi-partner collaborations, especially strategic frameworks, evaluation processes, and support for next stage funding. The investment in these seems worthwhile, as collaboration with multiple partners – particularly with non-academic partners – is strongly associated with impact.

However, there are clearly limits to the enabling nature of structures and processes. The complexity of the signature awards may have curtailed the opportunities for partners to contribute to the design, which was perceived as a negative aspect of this type of grant.

EQ 2: To what extent are structures and processes in place to strengthen R&I capacity in LMICs and the UK?

EQ 2: Key findings

The most often reported types of programme-level support received were assistance with networking opportunities, assistance with securing a no-cost grant extension, and assistance with communicating or distributing research outcomes.
GCRF award support and research experience significantly enhanced proposal writing and understanding of the research landscape.
Signature programmes were 7.3pp more likely to report improved capacity to secure future funding.
Collaborating with three or more non-academic partners was associated with increases in all dimensions of capacity building, in particular with improved R&I partnerships.

Strengthening capacities for ODA research has been a key objective of GCRF, and is likely to be an important legacy of the fund in both LMICs and the UK. The regression analysis found that programme-level support received by award holders has had positive effects on key R&I capacities. These include improved capacity to write research proposals, successful mobilisation of follow-on funding, and improved knowledge of the research landscape.

From the perspective of the LMIC partners, LMIC-based survey respondents agreed that involvement in GCRF awards had contributed to new or improved skills, which was a key objective. The effect of this was strongest for the following dimensions:

- new or improved management practices, knowledge, or research findings
- new or improved sustainable R&I partnerships
- new or improved skills and infrastructure in LMIC target countries
- new or improved stakeholder networks in LMICs.

Collaboration in design with three or more non-academic partners is, again, positively associated with increased probabilities of all the dimensions of capacity building surveyed, for both LMIC and UK respondents. LMIC respondents reported around 4.8–7.4 pp in achieving improved connections to UK and global networks and improved R&I skills and infrastructure in their countries. For UK respondents, the data suggests an increase of 8.8 pp in achieving improved R&I partnerships.

These findings highlight the importance of programmatic support for new types of capacity needed for partnered ODA R&I. Again, the signature investments were highlighted as providing more programmatic support than other types by design, but the PO survey confirmed that many other programmes also provided support. These findings highlight how programmatic support adds significant impact value to the grant investment, justifying the deployment of programme management resources.

EQ 3: To what extent are processes to support challenge-led research efficiently implemented? Are they proportionate for UK and LMIC stakeholders, are they timely and do they offer value for money?

EQ 3: Key findings
The majority deemed GCRF funding sufficient, but fewer received it in a timely manner. Additionally, 26.9% obtained additional funding, representing both HIC and LIC awardees.

The majority of POs prioritised fairness in opportunity and benefit sharing, with special attention to financial fairness (more than to process fairness).
Awards that included collaboration with three or more non-academic partners were 9.3 pp more likely to obtain further funding and were also significantly more likely to report fairness of opportunity, process, and benefit sharing.
LMIC respondents who were involved in the design of projects were more likely to report success in obtaining further funding, suggesting that such collaborations could contribute to improved capacity.
All measures of fairness significantly increased the likelihood of reporting three or more positive outcomes (by between 8.5 pp and 15.4 pp) and three or more positive outputs (by between 7.4 pp and 15.5 pp).

The dimensions of efficiency and proportionality explored by the survey were: the sufficiency and timeliness of GCRF funding; the award catalysing further funding; how fairness has been supported – fairness of opportunity (before research), fairness of process (during research implementation), and fairness of benefit sharing (after the award). Once again, we see the importance of collaboration and promotion of fairness as processes that can lead to higher probability of reporting outcomes.

The majority of respondents found GCRF funding sufficient, but the timeliness was an issue for more than half. This chimes with delays around disbursement that we have seen flagged in other evaluation modules, especially disbursement to LMIC partners arising from due diligence requirements. The Covid-19 pandemic and the subsequent ODA funding cuts are likely to have influenced perceptions of timeliness.

Perceptions of funding sufficiency and timeliness were consistent across signature and non-signature programmes. LMIC respondents, however, were more likely to find the level of funding sufficient than were their UK counterparts. This could reflect the lower costs of R&I in LMICs, and suggests a potential opportunity to calibrate budget allocations accordingly while maintaining fairness.

Catalysing follow-on funding is an important dimension for value for money. Collaboration again emerged as a key variable in increasing the probability of success in obtaining further funding. This finding holds for both LMIC and UK respondents. LMIC respondents who were involved in the design of projects were slightly more likely to report success in obtaining further funding. This suggests that promoting involvement in design, which is key to equitable partnerships, could also generate additional benefits.

With regard to fairness, the regression analysis showed that including three or more non-academic collaborators had a strong positive impact on all three dimensions of fairness – opportunity, process and benefit sharing. In addition, all measures of fairness significantly increased the likelihood of reporting three or more positive outputs and outcomes. Measures of fairness likewise increased the likelihood of reporting three or more positive outputs, with fairness of benefit sharing showing the largest impact. These findings highlight how ensuring fairness in all three dimensions is a driver of impact.

EQ 4: To what extent have the signature programmes made early progress towards their desired outcomes/impacts, and what evidence exists of these?

EQ 4: Key findings
GCRF awards showed early progress in fostering new insights and sustainable R&I partnerships, although translating insights into commercial products was an exception.
Signature programmes were significantly more likely to produce a range of R&I outputs, to reach a wide range of different stakeholders, and to experience use by policymakers.
Private sector stakeholders in both the UK and LMICs were the least likely to use GCRF researchers. This confirms that GCRF programmes have not produced high levels of commercial products, services, job creation, or businesses.
Collaboration with three or more non-academic partners increased the likelihood of seeing improved partnerships and networks and higher reported levels of all users of evidence.

The survey findings highlighted good reports of early progress towards desired outcomes and impacts, as framed by the results areas set out in the GCRF ToC. New insights and knowledge, and sustainable global R&I partnerships, emerged as areas where most respondents reported progress. Other results included new or improved management practice, knowledge, research findings, technology, methods and tools. The only area showing less progress was knowledge translation into commercial or business products or services, perhaps reflecting the lower proportion of commercially facing awards in the fund portfolio.

In terms of uses of R&I outputs, academic and research users were the most commonly reported. Policymakers at international, national and subnational levels and multilateral organisations were also reported, but more commonly by signature programmes than by non-signature award holders.

From the regression analysis, we can see that signature programmes produced a more comprehensive range of outputs – on average, one more than non-signature programmes. They also reached, on average, around 0.5 more users of programme information than non-signature programmes.

The pattern that emerges is that research and academic users form the core user group, with non-signature award holders more likely to give this answer. Signature awards tended to report a broader range of users, and more of them, including policymakers. Again, being part of a signature programme is a key factor, more likely due to their scale and to designs that integrate stakeholder engagement and positioning for use.

Collaboration with three or more non-academic partners again emerged as a key influence on progress towards outputs and outcomes. This variable increased the likelihood of achieving more positive outputs and of seeing improved partnerships and networks.

These findings highlight how, where widespread uptake, policy impact and use are desired, the design and programmatic approach taken by signature programmes have made a clear contribution.

EQ5: What particular features of award and programme processes have made a difference in positioning the signature investments for overcoming barriers and achieving their desired outcomes in different contexts?

EQ 5: Key findings

The survey identified five key barriers for award holders, with political, governance, security challenges, and inadequate technical and financial support being the most significant.
Programmes in LICs were 10.9 pp more likely to report barriers, experiencing, on average, 0.28 more than programmes located only in HICs.
Disruption arising from cuts to GCRF budgets also significantly increased the likelihood of respondents reporting barriers. Disruption related to Covid likewise emerged as a barrier.
Awards which included three or more non-academic collaborators in design were more likely to report a higher number of barriers. This suggests that there are challenges involved in working in a consortium, despite the importance of collaboration for outcomes and outputs.
All types of barrier, except for physical geography challenges, decreased the likelihood of reporting three or more positive outcomes by a small but statistically significant amount. A lack of financial or technical support was more likely to impact LMIC respondents.

The survey asked about a range of barriers faced by award holders, from political factors to inadequate technical and financial support. Covid-19 and the ODA funding cuts were also identified as barriers.

The regression tested the effects of key variables on likelihood to report barriers – collaboration, location of respondent, experiences of funding cuts and Covid-19, and signature and non-signature programmes. The hypothesis predicted that LMIC respondents would experience greater barriers than UK respondents.

The regression highlighted that respondents in the lowest-income countries did face more challenges than others, likely due to a less developed research environment and technical capabilities, political instability and conflicts, and other factors.

This was one area where collaboration did not prove to be a positive variable, as awards which featured collaboration with three or more non-academic partners were more likely to report barriers.

These findings highlight that partners in LMICs do face greater barriers in implementing R&I. This suggests that future awards should feature appropriate financial allocations, management arrangements and capability strengthening to help overcome barriers, e.g. security and transport arrangements to assist with access to research sites, technical support to adapt methodologies, and capacity support for facilities such as laboratories.



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