Open Access Research: A Review of DFID's Policy and Practice

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"Open Access Research: A Review of DFID's Policy and Practice"

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Executive Summary

Assessing DFID's Research Open and Enhanced Access Policy

Research Consulting was commissioned by DFID to undertake this review of its Research Open and Enhanced Access Policy. The review comes at a time of **rapid development in the open access (OA) and open research data (ORD) landscapes**, and it aims to put DFID at the forefront of the international effort to promote openness and equity in research. The first phase of the review comprised an assessment of the performance of DFID's current policy. It showed that **DFID has made significant progress towards increasing access to its research outputs** in recent years. The policy has a broader scope than those of other development funders, most of DFID's published outputs are free to read online, and the majority of academic articles are made open access immediately upon publication. However, the review also showed that there is a strong case for improving **systems and processes underpinning research discoverability and accessibility**. For instance, much of DFID's research is not made available on Research for Development (R4D)[1] on a timely basis, very little research data is openly accessible, publication costs are not supported beyond the lifetime of a project, and there is no comprehensive process to monitor policy compliance. Table 2, further below, shows that DFID's existing policy falls short of current international best practice.

Building on this analysis, in the second phase of the study **we identified forty one opportunities to improve** the effectiveness of DFID's open access policy and bring it into line with recent developments in the field. The opportunities for improvement have been grouped around five themes (sections 2-6);[2] they have then been assessed using a cost-benefit analysis (section 7) that takes into account DFID's need to prioritise actions on the face of limited resources. From this analysis, a subset of **key recommendations** has emerged that will help DFID set priorities for action.

Embedding OA and ORD within DFID research

The review highlighted that DFID's Research Open and Enhanced Policy **is not fully embedded** within the practice of the organisation. Addressing this will require prioritisation of the following actions:

- Ensure that the policy is implemented across all programmes classified as research (Improvement 1, referred to as 'I1');
- Include OA/ORD requirements in key guidance documents (I4);
- Enhance OA and ORD support (I6).

Improving access to peer-reviewed articles

While DFID's approach was ambitious and comprehensive when the Research Open and Enhanced Access Policy was first released, the open access movement has made substantial progress in recent

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[1] DFID has developed Research for Development (R4D) as a central resource where DFID-funded research outputs are made freely accessible to the general public.

[2] To help navigate the document, opportunities for improvement have been numbered sequentially, i.e. the first opportunity for improvement discussed in the document was tagged as I1 (Improvement 1) and so on.

years. Keeping apace with **international good practice** therefore requires DFID to align its approach with other key donors and funders, in the UK and internationally. The following improvements should be considered:

- Endorse the Plan S principles, which have already been endorsed by key funding partners such as UK Research and Innovation, the National Institute for Health Research (NIHR), the Wellcome Trust and the Bill and Melinda Gates Foundation (I8);
- Establish a mechanism to enable payment of Article Publication Charges after the end of a programme, in line with other donors (I15);
- Publicly commit to rewarding openness in research evaluations and communicate evaluation criteria to authors so as to incentivise OA publication (I13).

Improving access to non-peer-reviewed research

About two thirds of the research outputs discovered in the first part of this study were classified as non-peer-reviewed publications. However, 43% of such literature was not deposited in R4D and thus may not be preserved and made discoverable for the long term. Increasing the accessibility of non-peer-reviewed outputs will depend on the extent to which DFID **improves the depositing workflow**. The following improvements have been identified as a priority:

- Require deposit of all outputs in a Plan S-compliant repository upon publication (I20);
- Establish a repository that meets the standards specified in Plan S – this could be done by upgrading R4D, creating a new DFID-owned repository or using a third-party service (I21);
- Standardise the depositing process and establish responsibilities for deposit among relevant staff (I22 and I23).

Improving access to research data

Open research data (ORD) is a complex and rapidly emerging area of policy, and research and development funders are still dealing with a number of unresolved ethical, financing, resourcing and data protection issues. In this context, DFID's current policy has **ambitious goals for open research data** that remain unmet in practice. Only two of the eleven programmes we reviewed in this study had made at least some of their research data open, and only four programmes had a data management plan in place. DFID has a range of opportunities for improving access to research data:

- Publish a separate ORD policy that focuses on strong processes and workflows (I24);
- Produce dedicated guidance on ORD, including the criteria for delayed deposit of ORD (I26);
- Build the skills and capacity to support researchers in dealing with ORD: this will be a long-term undertaking, involving development of the relevant capabilities centrally, within programmes or in partnership with other funders and service providers (I29);
- Encourage the use of certified 3rd party data repositories (I32).

Strengthening monitoring tools and processes

The review highlighted the **lack of a clear and systematic monitoring process** for the OA policy. Of the eleven DFID programmes included in this review, most Senior Responsible Owners (SROs) did not have a list of publication titles with complete metadata, four did not have an up to date list of publications

and several outputs were reported incorrectly. To improve the effectiveness of the policy, the following opportunities are available to DFID:

- Clarify processes and responsibilities for OA/ORD within programmes (I36);
- Support and train relevant DFID staff on the benefits of the OA/ORD policy and on positive actions to promote its implementation (I37);
- Establish a monitoring process that relies on the inclusion of publication data in Annual Reports (I39) and uses relevant reporting tools (such as ResearchFish, I40) and web-based monitoring tools (I41).

Setting priorities for DFID

We understand that the implementation of these recommendations will be influenced by cost considerations, including the political capital necessary to effectuate changes across the organisation. DFID is a development organisation that spends only 3% of its budget on research, and therefore it cannot be expected to dedicate as many resources to OA and ORD as a research funder. At the same time, OA supports and enhances DFID's mission and objectives: investing in making research open is likely to yield long-term benefits not just to our understanding of the problems affecting stakeholders in low and medium income countries (LMIC) but ultimately to their own ability to find solutions to such problems. The table below sets out the **key recommendations** arising from this review and sums up their likely cost (both financial and non-financial) and benefit or impact (see section 7).

Table 1. List of key recommendations arising from the review.

Key recommendation	Cost	Benefit
Endorse the Plan S principles and join cOAlition S (I8)	Low	High
Establish/choose a Plan S-compliant repository (I21) and require deposit upon publication (I20)	Medium	High
Include OA/ORD requirements in key guidance documents and contract/grant templates (I3/I5); ensure that such documents clearly define processes and responsibilities for OA/ORD, especially at programme level (I36)	Medium	High
Provide structured support to help SROs and researchers understand, implement and monitor OA and ORD policy requirements (I6/I28)	High	High
Establish a mechanism to enable payment of Article Publication Charges after the end of a programme (I15)	High	High
Publish two independent and interlinked policies & dedicated guidance on OA and ORD (I24/I26)	Low	Med-High
Ensure that all programmes classified as research fall within the scope of the OA and ORD policies (I1) and are adequately monitored (e.g. by including publication data in Annual Reports (I39) and/or using output reporting software (I40))	Medium	Med-High

Research Consulting

Table 2. Guide to funder policies on Open Access and Open Research Data[3]

■ The dark quadrant represents DFID's OA policy openness level, as evidenced in the review
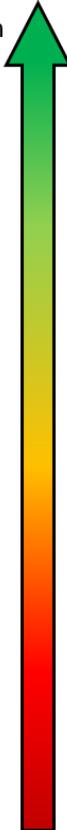
Fully open ↑

ARTICLE ACCESS	DATA & CODE ACCESS	REUSE	COSTS	COMPLIANCE
All articles resulting from funding must be published in a fully open access journal or posted in an open repository, with free, immediate readership rights.	Any data, code, and software needed for independent verification of research results must be curated and made freely and publicly available in an established, open repository no later than the publication of the first paper based on the data, or no later than the expiration of the grant, whichever comes first.	Research outputs (articles, data, code, and software) resulting from funding must be made available with generous reuse & remixing rights (e.g., CC BY/ CC0 licenses).	Funder will incur all costs associated with policy compliance, including fees (e.g., article processing charges, data storage) not included in original grant, with no time limit.	Funder proactively compiles proof of policy compliance as a component of interim and final reports, with grant disbursement contingent upon Conformity.
All articles resulting from funding must be published in a fully open access journal, posted in an open repository, or published in a "hybrid" journal, with free, immediate readership rights.	Any data, code, and software needed for independent verification of research results must be curated and made freely and publicly available in an established, open repository within 6 months of publication of the first paper based on the data or the expiration of the grant, whichever comes first.	Research outputs (articles, data, code, and software) resulting from funding must be made available with moderate reuse & remixing rights (e.g., CC BY-SA license).	Funder will incur all costs associated with policy compliance, including fees (e.g., article processing charges, data storage) not included in original grant, within a specified time period (e.g., for up to a year after grant expiration).	Funder requires grantee to provide proof of policy compliance as a component of interim and final reports, with grant disbursement contingent upon conformity.
All articles resulting from funding must be made freely available to read, in a journal or an open repository, after an embargo of no more than 6 months.	Any data, code, and software needed for independent verification of research results must be curated and made freely and publicly available in an established, open repository within 12 months of publication of the first paper based on the data or the expiration of the grant, whichever comes first.	Research outputs (articles, data, code, and software) resulting from funding must be made available with no commercial modification rights (e.g., CC BY-NC license).	Funder will incur costs up to a specified dollar value associated with policy compliance, including fees (e.g., article processing charges, data storage) not included in original grant.	Funder requires grantee to provide proof of policy compliance as a component of interim and final reports, with conformity a formal factor in future grant applications.
All articles resulting from funding must be made freely available to read, in a journal or an open repository, after an embargo of no more than 12 months.	Any data, code, and software needed for independent verification of research results must be curated and made freely and publicly available only when a research article to which it is related is published	Research outputs (articles, data, code, and software) resulting from funding must be made available with no modification rights (e.g., CC BY-ND license)	Funder will incur costs associated with policy compliance, provided these fees (e.g., article processing charges, data storage) are included in the original grant application budget.	Funder requires grantee to provide proof of policy compliance as a component of interim and final reports, with conformity an informal factor in future grant applications.
Grant recipients must submit a plan detailing how articles resulting from funding can be accessed by interested parties.	Grant recipients must submit a data management plan detailing how data, code, and software can be accessed by interested parties.	Grant recipients must submit a data management plan detailing how research outputs (articles, data, code, and software) can be reused by interested parties.	Funder will consider incurring costs associated with policy compliance, on a case-by-case basis.	Funder spot checks for policy compliance, with no formal mechanism for ensuring Conformity.

Fully closed

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[3] This is a summary assessment of DFID's policy based on the Open Research Funders Group Policy Development Guide.

Contents

1. Introduction

Summary   **Research Consulting was commissioned by DFID to undertake this review of its Research Open and Enhanced Access Policy. An interim report, released in July 2018, presented an assessment of the performance of DFID's current policy. This final report outlines the steps to be taken if DFID is to become an international leader in promoting access to the research that it funds.**

1.1 Terms of Reference

The UK Department for International Development (DFID) has commissioned a review of its Research Open and Enhanced Access Policy. Taking into account DFID's Digital Strategy 2018-2020, the Government's recent Transformation Strategy, and other relevant initiatives (such as IATI), the study aims to:

- review principles and good practice in the funder and donor landscapes;
- review the implementation of the open access policy and identify the challenges faced by RED managers and partners;
- propose options for policy development and for embedding the policy into existing processes and workflows at DFID;
- identify best-practice systems, tools and processes to improve the discoverability and accessibility of DFID research and evaluations, monitor policy compliance and measure impact.

1.2 Methodology

Phase 1 - Evaluation and assessment   The review of DFID's Research Open and Enhanced Access Policy comprised of two parts. The first part included desk-based evaluation of open access and open data policies, and an assessment of programme compliance. We considered over 70 research and development funders in order to identify potential comparators for DFID. From this initial survey we selected 18 organisations that have a mature open access policy, of which 9 also have a dedicated open data policy (see Appendix III).

The study reviewed a total 11 research programmes from DFID's Research and Evidence Division (RED), as outlined in Appendix III. The

selected programmes were chosen to collectively satisfy the following criteria:

- Cover the majority of RED's 11 research teams;
- Cover a range of academic disciplines, each having its own approach to open access;
- Started after the entry into force of the OA policy (2013);
- Are ongoing, making it easier to engage with relevant programme staff;
- Have been in operation for no less than two years, to ensure that they have produced research outputs;
- Have a variable number of research outputs (most have a large number of research outputs, with 1-2 having with fewer outputs);
- Include programmes co-financed with other organisations (development donors and/or research funders);
- Include programmes managed at consortia level, directly by DFID staff or directly by partner organisations (in whole or in part);
- Include data-intensive programmes; and
- Include programmes whose primary outputs are not publications (i.e. statistical data, training courses and so forth).

Participation in the study was voluntary and left to the discretion of the relevant Senior Responsible Owner or programme manager.

Phase 2 - Options analysis

In the second part of the review, we performed a more in-depth qualitative investigation of the key challenges to policy implementation outlined in the first part. We then identified, assessed and presented options to improve policy, guidance and practices at DFID. This was done through a mix of desk-based research and stakeholder interviews involving DFID staff, providers of scholarly communication products and services, and other experts. The full list of interviewees can be found in Appendix I.

1.3 Report structure

This document presents the results of our review of DFID's Research Open and Enhanced Access Policy and suggests actions to further embed open access and open research data across DFID's research activity. These include changes to the requirements of DFID's existing policy, updates to the accompanying guidance, and improvement to systems, tools and processes. Recommendations are grouped by thematic area. Section 2 focuses on actions aimed at embedding open access (OA) and open research data (ORD) in DFID's research activity. Sections 3, 4 and 5 present the recommendations on open

access for peer-reviewed research, non-peer reviewed outputs and open research data, respectively. Section 6 presents a set of recommendations regarding monitoring tools and processes. Section 7 presents a cost-benefit assessment of each recommendation, using quadrant analysis. Finally, section 8 provides a summary of key recommendations that indicate the priorities for DFID moving forward.

1.4 Background

Research at DFID

The Department for International Development (DFID) leads the UK's work to end extreme poverty. DFID is committed to high quality research that generates strong and applicable evidence that helps build good development programmes. The 2016 DFID Research Review shows that 3% of the Department's budget is invested in research, amounting to an average of £390 million per year over the 2016-2020 period, and an additional £357 million to fund research on infectious diseases through the Ross Fund Portfolio. Much of this is commissioned in partnership with other funders, including UK government departments, public and private research funders and international development donors supporting research in one of DFID's priority areas.[4] DFID also has an advisory role in relation to Overseas Development Assistance (ODA) research activities funded by other government departments, such as the £1.5 billion Global Challenges Research Fund.

DFID's work on open access and open research data

DFID recognises that open access to the research outputs it procures and, where appropriate, to their underlying data, supports its core mission of reducing global poverty and promoting sustainable development. Consequently, in 2013 it published a Research Open and Enhanced Access Policy[5] ("OA policy") to make its research freely available and to increase its use and impact.

The open access landscape is evolving rapidly

Since DFID's open and enhanced access policy came into effect in 2013 there has been significant progress both in the UK and globally towards increasing access to the outputs from research. Formal monitoring of progress has tended to focus on open access to peer-

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[4] In line with the UK Aid Strategy, DFID's research portfolio focuses on five priority areas: 1) strengthening global peace, security and governance; 2) strengthening resilience and response to crises; 3) promoting global prosperity; 4) tackling extreme poverty and helping the world's most vulnerable; and 5) delivering value for money.

[5] The Research Open and Enhanced Access Policy defines open access as referring to irrevocable and free online access by any user worldwide to fulltext/full version scientific and scholarly material ('outputs'). Enhanced access denotes steps taken to help users find, view and download materials.

reviewed journal articles, but there is also a clear trend for development funders to establish and/or mandate the use of repositories to preserve both academic outputs and grey literature.

UK and European funding bodies are committed to accelerating the transition to OA

Evidence from a recent report for Universities UK shows that the UK has taken a leading position internationally in the move to OA: 37% of UK articles were accessible immediately on publication in 2016 (up from 20% in 2014), and 54% within 12 months (up from 32%). This commitment to OA is set to intensify as UK funders move to implement the principles in the recently agreed 'Plan S'.

cOAlition S

A coalition of European research funders (cOAlition S) announced in September 2018 that they will require immediate open access to all of the scientific publications resulting from their support effective 1 January 2020. 'Plan S' is intended to accelerate the transition to OA in line with EU policy, and to address the rising costs associated with support of hybrid open access (whereby additional fees are paid to publish OA articles in subscription journals).

The Plan requires that authors retain copyright in their works (while granting most or all copyright prerogatives to the general public, in the form of an open licence), that publication in subscription and hybrid journals be prohibited, and that article publication charges (APCs) be capped. The Plan has had a mixed reception from publishers and some researchers, since it constrains authors' choice of publication venue. There are also concerns that it could result in barriers to read simply being replaced with barriers to publication, although its supporters argue this can be mitigated through the use of fee waivers for researchers in low income countries.

Current signatories to the plan include several key bodies that co-fund research with DFID, including UK Research and Innovation, Wellcome and the Bill and Melinda Gates Foundation. The National Institute for Health Research (NIHR) has also indicated its support, as have a number of funding bodies in China, the world's single largest producer of research publications. Other significant funding bodies, notably those in the United States and Germany, appear unlikely to sign up at the time of writing. However, the plan has been gaining support in some low and middle income countries, with the African Academy of Sciences endorsing the plan, and India considered likely to join in some form.

1.5 Open research data

Open data is slowly making its way in the research landscape

The open research data (ORD) policy landscape is less developed and more fragmented than the open access one. ORD practice is heavily influenced by disciplinary culture, types of data, infrastructure availability and sensitivity constraints, while the costs of making data open remain poorly understood. For these reasons, ORD policies tend to be less detailed and prescriptive than OA ones. Moreover, there are significant variations between the policies and requirements set by different funders, universities and other research organisations.

Interest in the value of ORD is growing and standards are emerging

However, there is a growing interest in, and understanding of, ORD. Over the years since DIFD's Open and Enhanced Policy was published, funders have adopted ever-more sophisticated ORD policies. These tend to be stand-alone documents that reflect the specific challenges affecting data. Consensus is generally emerging over the use of the FAIR Data Principles (making data Findable, Accessible, Interoperable and Reusable) as a standard in policy development. UK research funders and higher education institutions have developed a Concordat on Open Research Data which outlines common principles on the topic. Moreover, the forthcoming report of the Open Research Data Task Force should set a direction of travel for the UK research community. The development donor community has also undertaken significant work in this area, such as the analysis of open data policy and practice in the agriculture sector commissioned by GODAN, and the work on open data undertaken by CGIAR and the Gates Foundation, among others.

1.6 Open access for development

Open access in the development context

Open access and open research data are important tools to meet the UN's Sustainable Development Goals. By removing the often prohibitive financial barriers to accessing publications, OA helps those in low- and middle-income countries keep up with development in their fields, potentially increasing participation and diversity of perspectives in research. In addition, when research is open, participation is not limited to academics or formally-trained researchers. The burgeoning area of citizen or community science is a testament to what can be achieved when co-creation of knowledge with community members is encouraged.

International funders and governments have begun to recognise the value of building research infrastructures using open access models which allow for the two-way flow of information. However, some of

the context-specific requirements of the developing world are more complex, and require that governments and funders consider the unique needs of each country or regions when creating policy frameworks. For instance, the Open and Collaborative Science in Development Network (OCSDnet) works to promote open science in ways that take account of the development context and are driven by the local needs of scientists and stakeholders in the global South.

International development funders lack a common approach to OA

Development funders such as DFID tend to have open access policies that are broader in scope than research funders, with an increased emphasis on making reports, working papers and other non-peer-reviewed material openly available. Government donors (e.g. US AID, DFID) typically align themselves with the relevant national approach to OA, while international bodies such as the World Health Organisation and World Bank favour 'green OA', with no or limited support for 'gold OA'.[6] As noted above, development funders like the Gates Foundation, have chosen to adopt the principles of Plan S, which is gaining growing support in Europe and internationally.

1.7 Limitations affecting this report

The two phases of the study used different methodologies, each subjected to its own set of limitations. The following limitations affected the first phase of the review:

1. **Limited scope of the policy analysis.** The policy analysis covers a relatively small group of research and development funders with advanced open access and open data policies, and it cannot be considered a comprehensive analysis of current global practice on open access and open data.

2. **Limited data on policy effectiveness.** The policy analysis is based on publicly-available information about policy requirements and implementation mechanisms. With the exception of a small number of UK funders where OA compliance data is available, it does not look at the effectiveness of such policies.

3. **Risk of selection bias in programme selection**. The assessment of programme compliance involves 11 RED programmes that agreed to be part of the study: as such it may not be representative of overall programme compliance across RED and/or DFID and it may suffer from selection bias in favour of policy-compliant programmes.

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[6] For a definition of key terms, see Appendix II

4. **Programme sample size.** More broadly, the small sample of programmes cannot be considered fully representative of RED or DFID's work, the type of contractual relations it enters into with partners, the type of research outputs it produces and the breadth of management challenges it faces in the area of open and enhanced access.

5. **Completeness of programme outputs.** The review of programme outputs presented here is limited to those outputs that could be found using our methodology. Some research outputs mentioned by SROs could not be found online, while it is likely that other outputs remain entirely unreported. Such unknown outputs could significantly depress the overall picture of compliance presented in Appendix III.

The second phase of the review was subjected to a distinct set of limitations:

6. **Limited reflection of researchers' viewpoints.** In line with the terms of reference for our work, our consultation was restricted to DFID staff and a limited number of external stakeholders. Only a small number of researchers were included in the list of interviewees.

7. **Limited representation of low and middle-income countries' (LMICs) perspectives.** The effect of the suggested policy changes on LMIC countries was considered during the study. However, the suggested policy changes have not been explored directly with DFID's stakeholders and partners in these countries.

8. **Access to publishing in low and middle income countries**. Access to publishing in the developing world, and DFID's potential role in enabling this, were not within the scope of this review. The challenge of promoting open access among Southern academic journals would be worthy of consideration in a separate study.

9. **Limited consideration of the role of scholarly publishers.** An analysis of the position and direction of travel of scholarly publishing was out of the scope of this review, but the study gave some consideration to scholarly publishers in LMIC. We have also held conversations with stakeholders from the publishing sector and our knowledge of the OA landscape has informed our recommendations and analysis.

1.8 Acknowledgements

We gratefully acknowledge DFID's support throughout the project, in particular Dr Tom Drake, Julia Kemp, Sharon Skelton and Simon Keogh. We also thank the members of the DFID steering group for their guidance at key project milestones: Neil Jackson, Matthew Harvey, Seb Mhatre, Eunice Muthengi and James Warnock. Secondly, we owe a thank you to our project associates, Professor Leslie Chan, Professor Nigel Poole and Dr Michael Jubb, who were instrumental in framing the research questions, adding insights to our analysis, informing our methodology and navigating the complexities of this project. Finally, our thanks go to all the stakeholders that agreed to be part of this study, and who are listed in Appendix I to this document. The contribution of the above individuals to our work does not constitute endorsement of all the report's findings and conclusions, and responsibility for any inaccuracies or errors lies with the authors alone.

1.9 Navigating this document

The following sections will present a list of opportunities for improvement which are ordered sequentially as Improvement 1, 2, 3 and so forth and labelled 'I1', 'I2', 'I3' etc. Each improvement is also categorised as being related to:

- a change to the policy (marked by the symbol ![policy icon]( ))

- a change to guidance documents (![compass icon]( ))

- change to practice, i.e. tools, systems and processes (![gears icon]( ))

Finally, a list of key terms is contained in Appendix II to this document.

2. Embedding OA and ORD in DFID's research activity

Summary **The Open and Enhanced Access Policy should be embedded in DFID's key documents and workflows. An enhanced support function within the organisation would greatly benefit policy implementation.**

2.1 Introduction

The OA policy is not embedded within DFID practice

The review highlighted that DFID's Research Open and Enhanced Policy is not fully embedded within the practice of the organisation. A review of key policy and guidance documents and the stakeholder consultation showed a number of challenges:

- OA policy requirements are not reflected in key programme document templates and guidelines
- Policy requirements are not embedded in contracts, memoranda of understanding (MOUs) and grant agreements
- There is no dedicated support for open access and open research data inside the Department.

In order to embed open access and open research data within DFID practice, the policy requirements need to be reflected in the documents, contracts and workflows that guide researchers throughout the programme lifecycle. We have identified nine key entry points for embedding open access within DFID, broadly corresponding to three stages of the programme lifecycle: planning, contracting and implementation. Figure 1 summarises the entry points, which are then discussed in the reminder of this section.

Fig 1. Embedding OA in the programme lifecycle

2.2 Clarify the scope of the policy

It is unclear what programmes fall under the OA policy	It is unclear whether the policy applies to RED research only or to the entire corpus of DFID research. While the policy is worded so as to include all DFID research, it appears to have been interpreted in practice as only applying to RED programmes.

Define the scope of the policy (I1)

There is an opportunity to clarify that the OA policy applies to all programmes that are classified as research programmes, regardless of whether or not they sit under RED. This would make DFID practice consistent with other development donors – whose policies make no apparent distinction between research programmes and other programmes. It would also support an (as yet undeveloped) OA-specific Theory of Change for DFID, whose benefits are irrespective of whether the evidence is produced by RED or non-RED programmes. Communication accompanying the release of the policy should make clear that all research funded by DFID is subjected to open access requirements.

Plan for phased implementation of the revised policy (I2)

However, we realise that implementing the policy across the organisation is likely to place increasing demands on support staff and should be planned appropriately. An 'implementation phase' should be considered, alongside awareness-raising activities, during which DFID staff and partners can adapt to the new requirements. During the implementation phase, RED programmes could pilot the implementation of the most challenging aspects of the policy, such as those related to open research data or to monitoring and reporting.

2.3 Consolidate open access guidance

OA requirements are not embedded in programme documents	DFID has developed, adopted or endorsed a number of policies, guidelines and principles that overlap or have an influence on the implementation of its Open and Enhanced Access Policy. This may make it difficult for researchers and SROs to keep up with the various requirements they are expected to meet and may disincentivise compliance.

At the same time, open access is not reflected in key programme documents – therefore creating a disconnect between high-level policy and programme-level practice. For example, DFID asks all research programmes to adopt a framework to measure results, but key programme guidance (e.g. Guidance on using the revised Logical Framework, Writing a Business Case, Guidance for Developing a

Theory of Change and Smart Rules for Better Programme Delivery) does not make any direct reference to research uptake and open access as key performance indicators (KPIs). Whilst this may be justified in light of the relatively minor role research plays in DFID's spend, the result is that impact through open access is not prioritised and embedded into programme activities.

Consolidate OA guidance into one document (I3)

A clear opportunity for improvement is for DFID to consolidate guidance for open access as it is reflected in both high-level policies and programme-level documents. DFID could collate all published guidance for research programmes into one document. Such document should contain all references to OA/ORD requirements and present relevant KPIs for research programmes. For instance, The Logframe Guidance for Research Programmes recommends that SROs set measurable KPIs, including measuring the number of peer-reviewed primary research papers made available in open access format whenever relevant. Business Case guidance for research programmes could therefore require SROs to build a Strategic Case from the outputs and KPIs set out in the programme's Logframe (e.g. number of peer-reviewed articles); a Financial Case that estimates the cost of meeting those KPIs (e.g. cost of Article Publication Charges or APCs); and a Management Case that sets in place procedures for monitoring and evaluation (e.g. annual and final reviews). The KPIs should be consistently reflected in results framework documents. For instance, DFID's Health Research Team Results Framework includes a core requirement to measure the number of publications and datasets that are made open.

The aim of the consolidated guidance should be to embed open access within a programme's vision and mission from the early stages, prompting SROs and researchers to think about the end users of their research and the best ways of reaching them. The document can be used to guide SROs and programme managers and to benchmark annual and post-grant monitoring activities. The consolidated guidance could also contain practical examples of how open access and open research data have been used to further development objectives.

Consolidate OA resources into a dedicated webpage (I4)

Secondly, DFID could create an Open Access page within DFID's website containing links to the policy and FAQs explaining how the different policies overlap and interact. These include, but are not limited to:

- DFID Evaluation Strategy 2014-2019

- DFID's IATI Guidelines (Policy)
- Inclusive Data Charter
- Code of practice for statistics
- DFID's Digital Strategy 2018-20 and the related Digital Service Standards and Principles for Digital Development
- Research Uptake Guidance.

2.4 Add an open access clause to funding agreements

Contracts and grant agreements lack an open access clause

In order to 'have teeth', requirements from the open access policy should be reflected in contracts and grant agreements and consequences for non-compliance clearly spelled out. This is not currently the case in the contracts we have reviewed. Moreover, the lack of an OA clause in these agreements generates confusion in multi-donor research programmes, which are likely to have overlapping OA policies.

Add OA and ORD requirements to contract and grant agreement templates (I5)

DFID could review contracts, grant agreement templates and other relevant programme documents to ensure that OA policies are adequately reflected, clear responsibilities assigned and consequences for non-compliance spelled out. For example, in an Accountable Grant Agreement, this could include an 'Open access' section placed between the 'Information rights' and 'Transparency' sections. DFID may consider adding separate clauses for open access and open research data, with sub-clauses for individual outputs.

For instance, an open access clause may be worded as follows:

"The Partner will make all research outputs arising from the work undertaken in this programme available to the public on an open access basis. The partner will do so in accordance with the provisions contained in [DFID Research Open and Enhanced Access Policy, available at this page www.gov.uk/government/publications/dfid-research-open-and-enhanced-access-policy].[7]

The Partner commits to inform [DFID] of the steps taken to implement the Open Access policy and to share a list of all publications, and their open access status, as part of the annual reporting process; the Partner further commits to inform [DFID] of

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[7] The legal basis for including a contractual obligation to make research outputs open access is provided by the Standard Terms and Conditions (paragraph 21), which assigns to DFID a "perpetual, world-wide, non-exclusive, irrevocable, royalty-free licence" to use, reproduce, publish and sub-licence all research materials. The open access clause should therefore be included in the contract to clarify under what conditions, and with what limitations, the transfer of copyright to academic publisher is compatible with DFID's non-exclusive licence to the material.

the steps taken to implement the Open Research Data policy, including reviewing and updating the Access and Data Management Plan as part of the annual reporting process.

Failure to comply with the open access policy may affect the Partner's ability to apply for further funding from DFID in the future.

The clause should also stipulate which open access policy applies in the case of co-funded programmes with multiple funder policies. In the clause above, the text in brackets could be replaced by the name of the applicable policy and funder.

2.5 Provide support for open access

There is no dedicated go-to person for open access

Time and resource constraints faced by researchers and SROs, the low profile of open access and the lack of monitoring and compliance systems are major stumbling blocks in policy implementation. Author motivations to comply with the open access policy are directly affected by the consequences of non-compliance, and the level of support available.[8]

Identify appropriate resourcing for OA support (I6)

The efficacy of the open access and open research data policies would be greatly improved through structured support. Effective implementation of the OA policy would benefit from support with the following activities, among others:

- assisting SROs and researchers to navigate OA/ORD processes and systems;
- assisting SROs and researchers to understand the requirements of the policy;
- tracking policy progress against objectives and key performance indicators;
- understanding organisational challenges and identifying opportunities for embedding OA within DFID;
- raising the profile of OA/ORD within the organisation relationship-building with key staff and partners;
- landscape monitoring and participation in external fora and activities related to OA and ORD.

DFID has the opportunity to identify appropriate ways of ensuring the above activities are undertaken. There are various approaches

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[8] For evidence of the relationship between funder enforcement, infrastructure and open access compliance see Lariviere and Sugimoto. (2018). Do authors comply when funders enforce open access to research?

to provide structured support. Some donors and most funders have created specialised OA support roles, helping researchers and staff with advice, guidance and administrative support, raising awareness of the policy within the organisation and monitoring its implementation. For instance, the Wellcome Trust has five members of staff working on all the dimensions of open research (publications, data, clinical trials and so forth). In the development community, the Bill & Melinda Gates Foundation created a dedicated role for internal OA support shortly after its policy was enacted in 2015 and throughout its two-year transition period to full implementation. The officer, working as part of the Gates Foundation Library's Knowledge and Research Service, focuses on implementation of the policy by implementing and running Gates Open Research, overseeing the Chronos management tool for submission and helping develop data guidelines in support of the policy. The officer also offers guidance on the implementation of the policy and reviews compliance.

Other donors have established processes to assign responsibilities for OA and ORD more fluidly. IDRC has a working group on OA with identified leads for open access and open data. DFID could encourage submission of proposals that cost in OA or data managers for all programmes that are likely to produce a larger amount of research. Data management could be effectively costed using existing tools and guidance (on this issue also see section 5.3).

A third option is to outsourced support services to an external provider, such as the UK Data Service (see section 5.3).

3. Improving access to peer reviewed outputs

Summary

DFID has an opportunity to work with UKRI, Wellcome and other key funders to develop an updated policy which is aligned to the Plan S principles. It could indicate its support for a more open and equitable research system by signing the San Francisco Declaration on Research Assessment. There is a need for post-grant funding support for APCs, and a mechanism to control costs.

3.1 Introduction

OA to DFID articles has been increasing over time

We found that the proportion of open access articles in the 11 RED programmes selected for review is broadly in line with other UK funders and has been growing in recent years.[9] However, overall compliance across DFID's research programmes may be lower due to selection bias in the sample. Appendix III contains a summary of the performance review across the selected programmes. A consultation with researchers and journals in low and medium income countries could provide further insights into the challenges they face in complying with open access requirements.

3.2 Align DFID policy with other funders

The OA landscape is changing

DFID's support for Gold and Hybrid journals is in line with the majority of other funders considered in this review, and it permits publication charges to be met as an eligible cost of project funding. However, the policy landscape is changing, with a recognition that the Hybrid model has not enabled a broader transition to OA. Plan S presents DFID with an opportunity to develop a revised policy that is harmonised with those of other key funders, both in the UK and internationally (most notably UKRI, Wellcome and the Gates Foundation). For researchers, misaligned policies can be confusing and offputting, particularly in the case of multi-donor research programmes.

Pursue alignment with UK funders (I7)

Harmonising DFID's open access and open research data policies with those of other funders is a clear opportunity for improvement. DFID should pursue overall alignment of policy principles with other UK funders, including UK Research and Innovation and the National

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[9] For more details on the selected programmes, see Appendix III.

Institute for Health Research (NIHR), whilst recognising that specific policy provisions will need to be tailored to each funder's needs.[10]

Join cOAlition S (I8)

With regards to peer-reviewed publications, Plan S provides a new set of high-level principles, and accompanying guidance, that are driving open access development in Europe and beyond. Plan S requires that authors retain copyright on their publications, which must be published under an open licence. It also stipulates that publishing in hybrid open access journals is not compliant with the Plan's principles, unless so-called 'transformative agreements' are in place. DFID could considers joining the coalition of Plan S signatories ('cOAlition S'), which includes UKRI, Wellcome and the Gates Foundation. DFID should engage in discussions about the translation of the Plan S principles into both the UK and international development contexts, and ensure its internal policy development process is informed by the Plan S principles. Arrangements for the implementation of Plan S will be open for consultation until February 2019, with implementation starting from 1 January 2020 onwards. DFID should ensure that due consideration is given to the need for transitional arrangements beyond 1 January 2020, for example by permitting publication costs associated with transformative OA agreements for a defined period.[11]

Assess effects of Plan S on LMIC publishers (I9)

DFID should work with other ODA funders to ensure that the implementation of the Plan S principles does not restrict the development of publishing and repository infrastructure in low and middle-income countries (LMICs). As of the date of this report, the implementation guidance requires that journals/platforms provide automatic APC waivers for authors from low-income countries and discounts for authors from middle-income countries. It also introduces quality criteria for compliant OA journals, platforms and repositories. Further consideration should be paid to whether and how these criteria might be met by publishers and infrastructure providers in developing countries. There may be a case for DFID adopting different arrangements for LMIC publishers and providers,

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[10] We note that UKRI's constituent councils themselves have non-harmonised policies at the present time. UKRI is conducting its own review of its open access policy, which is expected to conclude later in 2019, but some variation in policies is likely to remain given the councils' differing strategic priorities and disciplinary focus.

[11] Plan S' implementation guidance states that contract negotiations for transformative agreements need to be concluded before the end of 2021 and that contracts should not last longer than 3 years. It further states that the effects of these agreements will be reviewed in 2023.

3.3 Research outputs do not have an open licence

Open licences are only recommended, and often not used in practice

DFID's policy encourages, but does not require, the use of open licences such as Creative Commons (CC), favouring 'CC BY'.[12] This is not in line with current international good practice, whereby many funders specifically require the use of open licences. A number of other funders now make CC BY a requirement of their policies (Figure 3).

Fig. 2 - Licensing requirements (n=18)
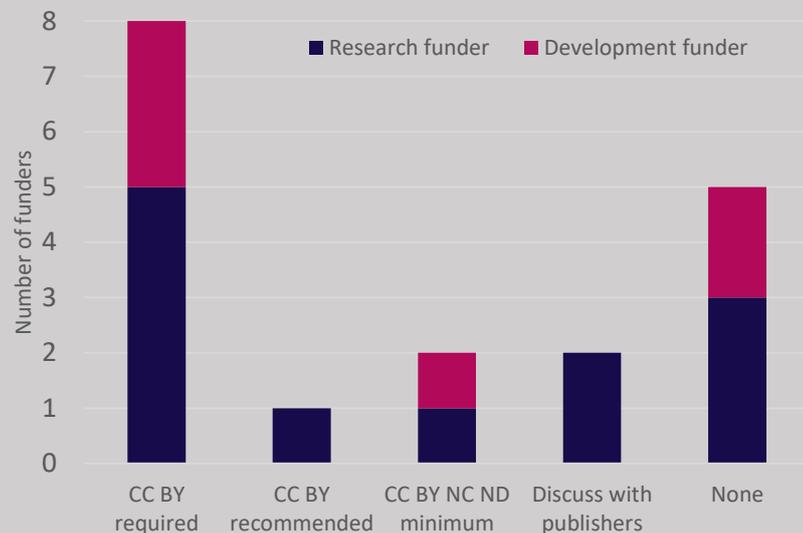
The policy also states that:

"Outputs must be clearly marked with the chosen licence so that users know what they can and cannot do with the output."

While all outputs within R4D (see section 4.4 for details) are covered by an Open Government Licence 3.0, this is not intended for outputs produced by educational and research establishments.[13] Moreover,

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[12] CC-BY is a Creative Commons licence that allows anyone to copy and redistribute the material in any medium or format, as well as remix, transform, and build upon it for any purpose, even commercially. Licencees are only required to give appropriate credit to the author, provide a link to the licence, and indicate if changes were made: https://creativecommons.org/licences/by/4.0/

[13] The OGL is intended for public sector information, where a public sector body holds the copyright in information it produces. Educational and research establishments fall outside the scope of the PSI regulations (see here), and under the terms of DFID's standard contracts it receives a non-exclusive licence to use any material arising from a funded project, but it doesn't acquire copyright in, say, research working papers produced from DFID funding.

outputs are generally not clearly marked with the chosen licence. This is especially problematic for grey literature outputs stored outside R4D that do not have an open licence, thereby causing uncertainty over reuse rights for the intended audience.

Mandate the use of open licences in the policy (I10)

It is important that the language around licensing be strengthened and brought into line with Plan S, which contains different requirements for journal articles and other outputs. Plan S' implementation guidance states that scholarly articles are required to use a CC BY 4.0 licence, but that CC0 (public domain) and CC BY-SA (sharealike) are also permitted. CC BY-NC and CC BY-NC-ND[14] are not permitted. For outputs that are not journal articles, Plan S simply requires the use of an open licence.

The new OA policy could therefore be worded as follows:

"Authors retain copyright of their publication with no restrictions. All publications must be published under an open licence, and preferably the Creative Commons Attribution Licence (CC BY) 4.0.

For scholarly articles, DFID requires the use of the CC BY 4.0 licence. In addition, it will accept the use of the CC BY-SA 4.0 licence, and publishing in the public domain (CC0)."

Display open licences across research outputs (I11)

We further highlight the benefit of having a process in place to ensure that all funded research outputs display an open licence. This is especially important for grey literature and would bring DFID in line with international good practice. For instance, the International Development Research Centre (IDRC) mandates submission of all outputs to IDRC Digital Library through an online system that appends a cover page with an open licence (as an example, see the cover page of the document at this link). Similarly, the majority of The World Bank-published content in the organisation's eLibrary is licenced under the Creative Commons Attribution (CC BY) licence, with few exceptions. The licence is generally displayed in The World Bank's grey-literature publications.

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[14] CC BY-NC (Attribution – Non Commercial) is a Creative Commons licence that allows anyone to copy and redistribute the material in any medium or format, provided that the licensor is credited; and it allows remixing, transforming, and building upon the material except for commercial purposes: https://creativecommons.org/licences/by-nc/2.0/uk/. CC BY_ND (Attribution – no Derivatives) is a Creative Commons licence that allows anyone to copy and redistribute the material in any medium or format for any purpose, even commercially provided that appropriate credit to the licensor is given (attribution) and that the original work is not modified (derivatives): https://creativecommons.org/licences/by-nd/2.0/uk/

Open Access and Intellectual Property

IP and access to publications

While there are several contact points between OA and intellectual property (IP), open access to publications is not in principle prejudicial to a strong regime on IP protection. DFID's existing OA policy states that "DFID standard contracts give DFID an irrevocable worldwide licence to use all material produced through research, while allowing researchers to retain all intellectual property rights over that material". In generic terms, open access merely enables more effective dissemination of research that is already in the public domain – any confidentiality concerns should have been unearthed and resolved in the process leading to the publication of the research in the first place.

Concerns can however arise over the use of open licences that give irrevocable rights to reuse research findings. While DFID's current OA policy favours open licences with no reuse restrictions (i.e. CC BY), it also allows the IP holder to limit reuse rights by assigning more stringent licences such as CC BY-NC, forbidding commercial reuse of the research. Some humanities and social science researchers have also advocated for the use of CC BY-NC-ND licence in order to prevent misuse, misquotation or mistranslation of the research.[15] However, these licences are not consistent with the Plan S principles, on the basis that they severely limit reuse of research findings, undermining research conducted using text and data mining and artificial intelligence. Instead, the plan allows use of CC BY-SA[16] which allows commercial reuse of research on condition that the material produced using the research is in turn re-shared publicly under the same CC BY-SA licence.[17]

IP and access to research data

Similar concerns affect open research data. Non-disclosure of commercial or otherwise sensitive IP constitutes legitimate grounds for exception in complying with the requirements of any open

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[15] See, for instance, the argument put forward by the British Academy for the Humanities and Social Sciences: www.thebritishacademy.ac.uk/sites/default/files/British_Academy_paper_on_Open_access_and_monographs -May_2018.pdf at page 4.

[16] The Creative Commons Attribution-Share Alike lets others remix, tweak, and build upon the work even for commercial purposes, as long as they credit the author and licence their new creations under the identical terms: https://creativecommons.org/licences/by-sa/4.0/

[17] For more on this topic, see: https://www.cambridge.org/core/books/open-access-and-the-humanities/open-licensing/E945CF8DD5880B03D6BB7E4ECAED5D79/core-reader

research data policy. As discussed in section 5, the guiding principle, is that data should be 'as open as possible and as closed as necessary'. Jisc has published a Toolkit for Research Data Management that contains guidance on intellectual property. When assigning reuse licences to ORD, a machine-readable licence should be assigned wherever possible so as to enable text and data mining.

Finally, there are fairness considerations with regard to the IP of Southern researchers – as discussed in section 5.4. To allay these concerns, we suggest allowing a limited delay in the opening of research data so as to give researchers time to write publications. For instance, researchers could be required to make their data open within 12 months from the end of a programme. It is also worth noting, however, that some indigenous communities are calling for culturally appropriate licensing that protects traditional knowledge, to be used in certain contexts as an alternative to Creative Commons licences. DFID should consider whether scholarly journals using traditional knowledge licenses could in some cases constitute an acceptable exception to the policy. For more information, see: http://localcontexts.org/tk-licenses/

3.4 Challenge expectations about publication venues

Authors' focus on high impact journals can be counter-productive

Researchers reported to us that DFID emphasises the importance of carrying out "high quality, relevant research" which, in the case of peer-reviewed research, is commonly understood by researchers as publishing in 'high-impact' journals. However, there is growing evidence that the focus on publishing in such journals can be detrimental to researchers' career development, can impede the transition to open access, and may prevent research results reaching policymakers and end users in LMICs.

Endorse DORA (I12)

At the level of policy, DFID should emphasise that high quality research is not dependent on the publication venue. DFID could become a signatory of the San Francisco Declaration on Research Assessment (DORA) and state its support for DORA's principles in the policy preamble.[18] A focus on author incentives is front and centre of Plan S. Changes to the policy in line with Plan S, which is also supported by UKRI, would make explicit that DFID considers a broad range of impact measures for the purposes of research

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[18] DORA was signed by 724 organisations, including 6 UK research councils and Research England. Among development donors, the Gates Foundation is one of the signatories.

evaluation (including influence on policy and practice), and that it does not assess research quality based on the journal impact factor.

Commit to rewarding research openness (I13)

At the level of practice, DFID could sign up to existing initiatives that promote holistic approaches to research evaluation, including those that consider the societal impact of open research. This would send a clear message to researchers that DFID values research impact (and openness) and that publishing in high-impact factor journals is not a synonym of quality. For instance, the Open Research Funders Group (ORFG) has recently published a set of guidelines to encourage researchers to share their research outputs. The guidelines, or Incentivization Blueprint, show that OA policy effectiveness relies on a range of measures that support its implementation (including training, monitoring and transparency) and stakeholder engagement (chiefly by reviewing the way research is assessed). Alternatively, DFID could look into integrating IDRC's Research Quality Plus (RQ+) into its research evaluation. RQ+ embraces a broad definition of research quality that includes scientific rigor but also takes into consideration factors that are contextual to LMIC and as such it may provide a transparent set of criteria for DFID research evaluation.[19]

Communicate revised evaluation criteria in guidance documents (I14)

At the level of guidance, DFID could communicate more explicitly to both SROs and partners that research is assessed on its intrinsic merit, not the venue of publication. This renewed emphasis on intrinsic quality should also be reflected in relevant guidance documents. For instance, reference to the DORA declaration could be made in the Research Uptake Guidance and in the how to note on Assessing the Strength of Evidence. Researchers should be encouraged to publish in reputable open access journals or platforms such as those listed in the Directory of Open Access Journals (DOAJ), and especially high-quality OA journals from LMIC. Alternative indicators of impact, such as those based on the Altmetric score, or ResearchFish's Narrative Impact, could also be highlighted.

3.5 Establish a mechanism to fund post-grant publications

No support is available for OA publishing costs after the end of a programme

DFID policy makes no provision for the funding of APCs after a grant or contract has finished, meaning publications that are produced at this point are unlikely to be made immediate OA. Other research funders who expect or encourage immediate OA generally provide post-grant funding support through:

- institutional block grants;
- dedicated post-grant APC funding; and/or
- direct applications to the funder.

Amongst development funders, the Gates Foundation and IRDC also offer mechanisms for reimbursement of APCs for up to two years after project conclusion, via the Chronos system and the Project Site Page respectively. Given the long publication time in many academic journals, the proportion of outputs that are published after the end of the programme can be substantial (depending on the discipline, the amount and quality of the data collected in the programme etc).

Post-grant OA fund (I15)

DFID should establish a mechanism to fund post-programme publications, in discussion with other ODA funders. The fund could be administered internally or by a partner organisation.[20] IDRC and the Gates Foundation have an internal fund to support the payment of APCs for up to 24 months after the end of a programme, and we recommend using a similar time window.

Should it pursue this option, DFID might decide to set aside a relatively small initial budget (in the region of £150-200k per annum, with the prospect of scaling up over time) as experience with other funders showed that a limited proportion of researchers initially accessed post-grant funding of this nature. However, IDRC has indicated that the number of applications for support is rising considerably year on year, hence the size of the post-grant fund should be reassessed periodically as awareness rises.

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[20] For example, Wellcome operates the Charity Open Access Fund on behalf of five other health research charities, while a single open access block grant is awarded to research organisations by UKRI to cover outputs funded by the seven UK Research Councils.

3.6 Ensure value for money in publication expenditures

No mechanisms are in place to control APC costs

Our work suggests that DFID funds are used to pay 800 article publishing charges (APCs) per annum. At an average cost of £2,000, this implies total expenditure of **£1.6m per annum**.[21]

Table 3 – Estimated expenditure per annum by DFID on article publishing charges (APCs)

	DFID-supported articles (year)	Articles with APCs	Estimated APC cost
a. Articles deposited in R4D (40% of R4D total)	500		
b. Add: journals not deposited (60% of total)	750		
c. Total articles published per annum (a+b)	**1,250**		
d. Immediate OA articles (c. x 70%)		875	
e. OA articles where an APC was paid (d. x 90%)		**800**	
Estimated cost per annum (e. x £2,000)			**£1.6m**

Under DFID's existing policy, there is no cap on the level of article publication charge (APC) or book publication charge (BPC) that is eligible for funding, or the level of open access funding available per project.[22] High APC expenditure removes resources from research activities, and researchers are often reluctant to sacrifice their research budget to OA. High impact factor journals have some of the most expensive publication fees.

Take steps to ensure APCs supported by DFID funds are 'reasonable' (I16)

Both UK Research and Innovation and Wellcome have endorsed the Plan S principles, which could see the introduction of additional eligibility conditions for payment of APCs. Further work is planned by cOAlition S to explore how these conditions might be implemented in practice. In developing its new policy, DFID should monitor the outcome of this process, and consider adopting similar measures to ensure reasonable value for money in research publications.

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[21] DFID does not gather data on APC expenditure met from its grants. In order to calculate this figure we have used the mean APC paid by UK higher education institutions in 2016, which was £1,969 (£2,095 for hybrid journals, and £1,640 for fully OA journals). Source: UUK (2017) Monitoring the Transition to Open Access.

[22] For comparison, the Charities Open Access Fund (a partnership between six health research charities, managed by the Wellcome Trust) spent £7.2m on APCs. Research Councils UK provided OA block grants totalling £14m in 2016/17. Research Councils UK makes block grants available to Research Organisations; though not all of the block grant is spent on APCs

Moreover, it would be beneficial to include data on paid APCs in the full list of publications appended to annual reports (see section 6.4).

3.7 Assess the opportunity to create a DFID publication platform to support open access

DFID does not have an OA publishing platform

A number of research funding bodies have established their own OA journals[23] and publishing platforms.[24] Publishing platforms differ from journals in that they have a broader scope and audience (generally encompassing an entire discipline or all the research funded by an organisation) and encompass many different kinds of outputs. The World Bank publishes its own content through the World Bank eLibrary, a subscription-based product for institutions that adds value through its enhanced functionality and research tools. The OECD also has a publishing arm, OECD Publishing, and has licensed the platform to a number of other international bodies and charitable organisations. The Gates Foundation and the Wellcome Trust work with F1000 who provide a platform under contract to each, using a post-publication, open peer review publishing model (see case study) – specifically to bring speed of publication and accessibility to all the content submitted by authors. While publishing platforms provide a simple open access alternative to traditional publishing routes, more evidence is needed that this would be an appropriate way forward for DFID.

Monitor the adoption of new platforms by academic authors (I17)

Funder publishing platforms may provide an effective route to open access in the future (see text box below). Moreover, they could be used to disseminate grey literature more effectively, preserve it and make it discoverable. Uptake to date remains limited, however. In its first year Wellcome Open Research published 142 articles, for example, but paid (with its COAF partners) a total of 3,500 APCs – a ratio of more than 20:1 in favour of APCs. The platform also requires some local management and significant awareness and outreach to authors to drive uptake. The main uncertainty concerns the level of uptake of the platform among authors – whose research

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[23] See, for instance: NIHR journals library and eLife
[24] E.g.: Wellcome Open Research and Gates Open Research

dissemination strategy still relies heavily on journals – although there is early evidence that uptake is growing.[25]

There is potential in theory for DFID to develop its own journal(s)[26] and/or publishing platform, either independently or in partnership with other development funders. A dedicated platform that hosts all types of documents would progress DFID's aim of ensuring research is taken up into policy and practice. We suggest monitoring the take-up of publishing platforms over the next 12 months, and beyond 2020, when the commitment to incentivise and support new platforms and journals contained in Plan S may start to bear fruit. If there is clear evidence of increasing uptake, DFID could then perform a cost-benefit analysis on the adoption of a dedicated platform (e.g. using F1000 or ScienceOpen).

Case study: The F1000 publishing platform

Platforms based on F1000 Research use an open peer review process and store different versions of the document (from preprint to peer reviewed) as well as the reviewers' comments. For the non-peer-reviewed literature, the platform combines a repository function with a route to support access and usage. Currently, all documents published on an F1000 platform receive a digital footprint (digital object identifier or DOI[27]) and are provided with real time document-level reach and interest indicators (e.g. using Altmetrics). Typical use cases are the creation of a funder-specific platform (such as WellcomeOpen Research, Gates Open Research, or the African Academy of Science platform) or the creation of thematic platforms in collaboration with a third party (such as Emerald Open Research, which focuses on six themes aligned to Sustainable Development Goals identified by the United Nations (UN)). F1000 is also working to connect all the content in a hub called Open Research Central, so that publications on any of its platforms and gateways are interlinked and easily discoverable.

F1000Research charges an article publication charge (APC) for written outputs. APCs for peer-reviewed outputs are based on word

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[25] Our stakeholder consultation suggested that 2018 submissions to Wellcome Open Research are up by 32% compared to 2017.

[26] For example, DFID could create a journal to improve the impact of its systematic reviews, as recommended in Besemer, H. and Parr, M. (2013). Scholarly use of R4D documents: A bibliometric exploration.

[27] DOIs are used to identify academic, professional, and government information over the lifetime of the document even if its location and other metadata may change. Referring to an online document by its DOI provides a more stable linking than simply using its URL.

counts, irrespective of the article type. The adoption of these platforms is in part a response to the rising cost of APCs. F1000's charges of US$150-$1,000 (£115-770) per article are substantially lower than average APCs in traditional journals. Grey literature outputs (i.e. documents that do not go through the peer review process) are subject to a much lower APC, typically around $50 per document, that covers the cost of converting documents into XML, assign a DOI and usage metrics. No charge is levied on posters and slides, which are free to both view and deposit.

F1000 can set up a Gateway within about 3 months, for a one-off charge starting at around £10,000, rising to c. £25,000 for a dedicated, branded platform, depending on the level of customisation. It then charges about £2,000/year for an annual service charge, including upgrades, a helpdesk and so forth.

4. Improving access to non-peer reviewed outputs

Summary   **While DFID's grey literature is free to read, much of it does not have an open licence to enable reuse. Non-peer-reviewed outputs also suffer from problems of discoverability and long-term preservation. We do not recommend including evaluations within the scope of the revised policy, but the posting of preprints could be actively encouraged.**

4.1 Introduction

Non-peer reviewed publications form the bulk of DFID's research outputs

About two thirds of the research outputs discovered in the first part of this study were classified as grey literature, i.e. non-peer-reviewed publications such as reports, briefs and other documents. Because DFID's grey literature outputs are publicly available and grey literature is the most common form of literature, most research outputs identified from our work are free to read online. But although this research is free to read, many outputs lack an open licence granting irrevocable rights to access and reuse the content.

Fig. 3 - Research outputs from 11 DFID programmes (n = 569)

- Grey literature
- Journal articles
- Videos/media
- Datasets
- Books + book chapters
- Conference papers
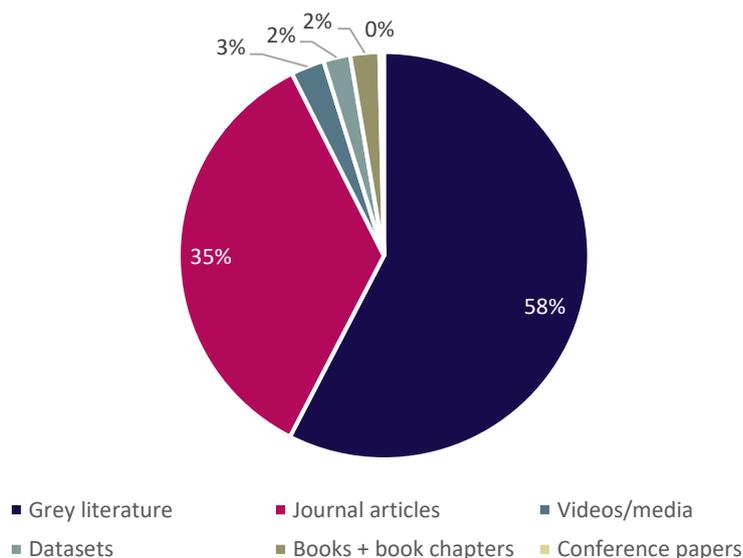
Consistently adopting open licensing is a cost-

DFID's open and enhanced access policy rightly treats non-peer reviewed literature as a distinct category of outputs. There is a clear need to help authors understand where to make such outputs available and how, stressing the importance of discoverability and

effective way to promote re-use

reuse rights. The policy could also make explicit reference to preprints, or original author manuscripts (see Glossary), encouraging researchers to post these online under an open licence. This would make non-peer reviewed research papers quickly available at no cost.

4.2 Clarify the link between evaluations and open access

The relationship between evaluations and the OA policy is unclear

The Terms of Reference of this review asked us to consider the inclusion of evaluation outputs within a revised OA policy. There does not seem to be any additional benefit from taking such a step. More clarity is needed, however, on the relationship between the open access agenda and the transparency agenda within DFID.

Evaluations should not be included in the OA policy (I18)

The terms of reference for our review indicated a desire to include evaluations in a revised Open and Enhanced Access Policy. We see two areas in which evaluations and open access policies overlap: (1) single evaluations and Annual Evaluation Reports could be considered grey literature for the purpose of the OA policy; (2) evaluation data could be subjected to the ORD requirements of the new policy. Both DFID's 2013 Evaluation Policy and 2015 Evaluation Strategy underline the importance of making evaluations public.

While there are clear overlaps between OA and evaluations, it is unclear what benefit the inclusion of evaluations in the OA policy would bring. We note that evaluations are subjected to more stringent requirements than those of the open access policy.[28] Evaluation documents are currently stored both in R4D and the IATI Datastore (displayed in DFID's DevTracker) following an international recognised standard. Other donors use a dedicated database for evaluations to facilitate meta-analysis by external stakeholders.[29] Relevant open access and evaluation documents could cross-refer to each other, but we advise that evaluations continue to be regulated separately from research outputs.

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[28] For instance, the 2015 Evaluation Strategy (sections 4-6) states that: "terms of reference for evaluations must include an outreach/dissemination plan and commissioning teams are responsible for ensuring the delivery of this plan. These individual evaluation communication plans are monitored as part of centrally managed quality assurance mechanisms to encourage use of DFID evaluations." The strategy further covers the production and communication of sectoral and strategic evaluation outputs, and the Strategy itself is monitored annually by the Investment Committee.

[29] For instance, over 10,000 evaluations of USAID projects are stored in the Development Experience Clearinghouse.

4.3 Expand the scope of the policy to include preprints

The OA policy does not mention preprints

The open access policy fails to mention original author manuscripts, or preprints. Preprints are gaining increasing popularity as a quick way to make academic research publicly available in a short time and without restrictions. The policy currently fails to capitalise on this opportunity.

Encourage the posting of preprints – and mandate it where there is a significant public benefit (I19)

DFID could consider encouraging or mandating deposit of preprints as a way of increasing the impact of its research. The new OA policy of the Wellcome Trust 'strongly encourages' researchers to post preprints of their completed manuscripts under a CC-BY licence, and similar provision is made in Plan S guidance. Moreover, Wellcome's policy also states that "*when there is a significant public health benefit to preprints being shared widely and rapidly, such as a disease outbreak, these preprints must be published before peer review, on an approved platform that supports immediate publication of the complete manuscript, under a CC-BY licence*". The Trust will publish a list of compliant preprint platforms by 2019.

DFID could adopt a similar approach to Wellcome, strongly encouraging preprint publication in all cases and mandating it where rapid access to the research findings is likely to produce a significant public health, environmental or livelihood benefit. Author manuscripts should be made available using a CC BY or CC BY-SA licence. For all other research, preprint posting should be encouraged and outputs should include programme metadata. In the long term, preprints might be published in DFID's own publishing platform, if that indeed becomes a viable path.

OA for monographs

Some of the research funded by DFID may be published in the form of monographs: long-form publications by one or more authors published by a university press or a commercial publisher; or as chapters in edited collections. Few funders (apart from the Wellcome Trust) have as yet implemented policies requiring OA for monographs, and cOAlition S has not produced any guidance so far on how it might handle the complex issues that would need to be addressed in any more widespread policy. The funding bodies for higher education in the UK have, however, indicated that they intend to establish such a policy for the Research Excellence Framework (REF) exercise expected to take place in the late 2020s. Long time frames are necessary, since monographs typically take

some years to complete, with publishing contracts often in place several years before a book is finally published.

Universities UK has established a working group to review the current landscape of monograph publishing, and to monitor progress towards OA; and its report will underpin a consultation paper that UKRI will issue in 2019. A number of small-scale OA initiatives have been established in the past 2-3 years, following a report on Monographs and Open Access (the Crossick report) in 2015. But the vast majority of both physical print and digital monographs – in the UK and the rest of the world - are still published on traditional commercial terms; and the kind of infrastructure that has been developed to support OA for journals does not as yet exist for monographs. Moreover, the economics of book publishing are very different than for journals, and it is not clear what kinds of funding regimes might be most effective in promoting a large-scale transition to OA, or how they might be established. Licensing issues are also more complex, particularly where third-party rights are involved; and most of the policy options currently being considered envision significant exceptions to any OA policy requirements. Nevertheless, it is important that DFID should keep abreast of developments in both policy and practice relating to OA for monographs in the UK and globally.

4.4 Establish a compliant repository

Full-text research outputs are not consistently deposited in a repository

DFID does not have a repository for its own research outputs, nor does it mandate the deposit of those outputs in a third-party repository. The redevelopment of R4D in 2015 has emphasised discovery of outputs by members of public, but at the expense of preservation and monitoring. While DFID's existing policy refers to R4D as a 'central, stable, permanent and free-to-access repository for the outputs of DFID-funded research', it no longer fulfils this function effectively as:

1. Full-text copies of outputs are not consistently deposited in R4D. Instead, many records are 'metadata-only', and rely on links to external websites for access to content, with no guarantee that these outputs will be preserved for the long-term;

2. Only limited metadata is recorded, with no details recorded on programmes with which outputs are associated, and a

number of other descriptors typically used by repositories not present.[30]

Research for Development (R4D) is a "finder" used to make DFID research outputs publicly available in one place, but it does not consistently hold full-text copies of outputs.[31] As such, it does not qualify as a compliant Open Access repository under Plan S.

Require deposit in a compliant repository (I20)

Plan S brings a requirement to deposit research outputs in a *compliant repository* that meets the quality criteria specified in Plan S' implementation guidelines. Among others, the repository must be able to: store full-text publications in machine-readable format; link to underlying data and code; assign DIs as permanent identifiers; and have high-quality metadata including complete and reliable information on funding (i.e. programme name and ARIES number). It is important that the revised policy incorporates this requirement.

Establish a compliant repository (I21)

Contextually, DFID should give its researchers the opportunity to deposit its outputs in a repository that meets the Plan S requirements. To achieve this, DFID has three options:

- Upgrade R4D to make it compliant with Plan S requirements;
- Develop a separate, DFID-owned repository (this can be a bespoke solution of an off-the-shelf software).
- Recommend the use of a third-party repository from a selected list of compliant repositories (e.g. using existing directories, such as OpenDOAR).

4.5 Process and responsibilities for depositing research outputs in an open repository

There is a lack of clarity surrounding depositing requirements

The current policy is ambiguous with regards to depositing requirements. While the policy requires deposit of both journal articles and grey literature, in practice there is no longer an unequivocal mandate to upload on R4D. Instead, research teams decide what outputs are uploaded, when and in what circumstances. Moreover, responsibilities for depositing research outputs on R4D or compliant repositories are unclear. The lack of a clear mandate to deposit outputs in a repository is inconsistent with other funders. It

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[30] Dublin Core is the basic, domain-agnostic metadata standard commonly adopted by repositories, and includes fifteen basic elements. Many of these do not appear to be recorded in R4D.

[31] Our review noted that the lack of metadata about programmes, grants and specific topics covered makes it very hard to find specific outputs in R4D, and to relate them to a programme for monitoring purposes.

resulted in low rates of deposit in R4D and would likely affect deposit rate in compliant repositories under a revised policy. Deposited outputs are frequently only available via programme or third-party websites, are rarely assigned a Digital Object Identifier (DOI) and often the relevant R4D entry contains broken weblinks.

Fig. 4 - Are research outputs in R4D?

(n = 569)
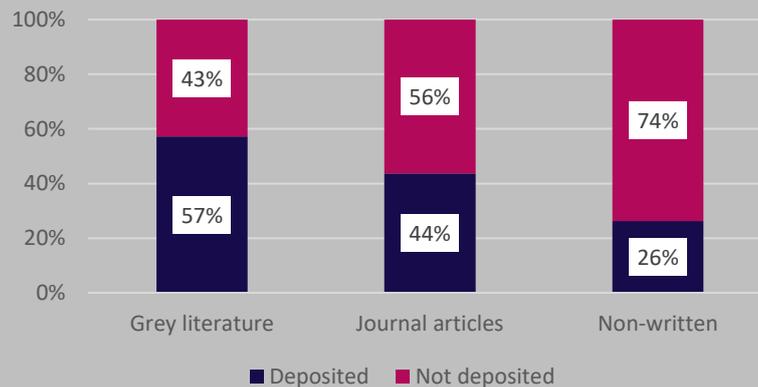
Require deposit upon publication (I22)

The current policy requires deposit of scholarly articles on R4D within 6 months and of grey literature within a non-specified timeframe. Clarity would be increased by requiring deposit of *all research* outputs in a compliant repository immediately *upon publication,* noting the possibility of an embargo period. The policy should not make any distinction between scholarly articles and grey literature. Contextually, the list of publications included in annual reviews (as discussed section 6.2) should include a checkbox of whether the publication is available on a compliant repository.

Clarify processes for depositing research outputs (I23)

The OA policy currently states that "researchers and institutions are required to deposit in R4D written outputs not intended for peer review journals as soon as it is feasible to do so." However, the review has revealed confusion about the process used to upload outputs in R4D, and the relevant responsibilities of SROs and Knowledge Managers. In fact, some SROs seemed unaware of the process to upload outputs in R4D and their role in it. The decision-making process for depositing research outputs in a compliant repository could be standardised and communicated more systematically to SROs. The process could be enshrined in the revised OA Policy Implementation Guide and other relevant documents.

5. Improving access to research data

Summary

To align with international practice, DFID should develop a separate, but linked, open research data policy. This should be underpinned by the principle of research data being 'as open as possible, as closed as necessary', and should endorse the FAIR Data Principles. It should focus on encouraging and supporting appropriate work practices, such as the production of Data Management Plans and Data Availability Statements. Further work in this area should focus on providing guidance and support to researchers, from both internal and external sources.

5.1 The open research data landscape

The slow development of common ORD practice

Research data is the evidence that underpins the answer to research questions and can be used to validate findings. Funders, researchers and policy-makers are now realising that without access to the underlying data, access to research findings is incomplete and its benefits restricted. However, practice differs across the research community, and is influenced by disciplinary cultures, by variances in the nature of research and the kinds of data produced, by the availability of relevant infrastructures and services, by levels of funding, and by constraints relating to the sensitivity of data.

Organisations like the Wellcome Trust and the Gates Foundation have advanced their policies on open research data (ORD) and funders across Europe are slowly converging towards a common approach. UK research funders and higher education institutions have developed a Concordat on Open Research Data which outlines common principles on the topic. But there are significant variations between the policies and requirements set by different funders, universities and other research organisations; and the language in which they are expressed is often not clear. The forthcoming report of the Open Research Data Task Force should, however, set a direction of travel for the UK research community.

Challenges to ORD

The barriers to widespread adoption of ORD practices are significant, and research funders are still coming to grips with the implications of their policies and the challenges these create. Making research data accessible in meaningful ways can take considerable time, effort and resources; and many researchers

lack the necessary skills in data management and curation. The costs of ORD therefore include:

- training and skills development;
- data management and curation;
- securing consent for data sharing;
- data cleaning;
- metadata creation; and
- managing transfer and access.

Such activities add to the costs of individual research projects, but also require a wide range of support services. The costs are significant, but their precise scale is at present unknown.

Finally, not all research data can be open, and access may need to be limited in a variety of ways in order to maintain confidentiality, guard against unreasonable cost, protect individuals' privacy, respect consent terms, as well as managing security.

Support and guidance

In this context, DFID's current policy has ambitious goals for open research data, but policy implementation is lacking. Only two of the eleven programmes we reviewed in this study had made at least some their research data open, and only four programmes had a data management plan in place (see Appendix III for more details). While the improvements for open access to publications revolve around making existing mandates more stringent and strengthening compliance, improvements in the area of ORD focus on providing clarity and support for researchers in deciding when and how to make research data open. There is an urgent need for more professional support as well as training for researchers and/or DFID staff in matters including data stewardship, data processing and analysis, and software development and sustainability. Appendix IV provides a full assessment of DFID's policy provisions on open data and compares them with recommended practice.

5.2 Open access and open research data policies have very different requirements

Bundling OA and ORD policies together may hamper their effectiveness

The requirements, expectations and challenges around open research data are very different from open access to publications. In particular, OA is subejct to more stringent requirements than open research data (ORD), and necessitates different monitoring and compliance mechanisms. The messaging and communication around each policy should also reflect these differences. Combining the two policies in the same document creates confusion and risks diluting the effectiveness of each policy.

Release a separate open research data research policy (I24)

Historically, funders have tended to include data as part of their open access policies. More recently, however, funders have recognised the need for autonomous data policies that are linked to the OA policy which take better account of the challenges and complexities associated with research data. Seven research funders and two development funders reviewed in our work have taken this approach, while a further five (like DFID itself) have a combined OA and open research data policy. DFID could publish a revised ORD policy that is distinct from the OA policy but linked to it, in line with the UK Research Councils and international practice. The ORD policy should be based on principles and objectives that protect the public interest in ORD while allowing researchers a say in what data is made open, when and how. 'Hard' requirements should focus on ensuring that the right processes are followed (e.g. completing access and data management plans and data availability statements). Extensive guidance should complement the policy to help researchers understand their options when making research data open. ESRC's Research Data Policy offers a good model by presenting a set of guiding principles, implementation guidance, ethical and legal guidance and a summary of tasks and responsibilities for researchers.

Reference the Concordat on Open Research Data (I25)

DFID may also consider endorsing, alongside other UK research funders, the principles contained in the Concordat on Open Research Data as a way of aligning policy and practice and sharing lessons with other funders. This will help ensure that future iterations of the policy, and the practical challenges to its implementation, are developed and harmonised in light of national good practice. By speaking with one voice, UK funders will also help enable greater compliance by authors. Recommendations from the UK Open Research Data Task Force on the implementation of the Concordat's principles are due to be published shortly, and should be taken into account in developing a new policy.

5.3 Improve open research data literacy among DFID staff and partners

Researchers lack skills, knowledge and resources on ORD

Many of the challenges around open research data concern lack of skills, knowledge and resources, including time, on the part of researchers and DFID staff. The open research data policy cannot be effectively implemented unless clearer guidance and support is made available to research partners.

Provide dedicated guidance on open research data (I26)

A range of activities will be needed to improve open research data literacy across DFID staff and partners, and on multi-funded programmes. DFID could prepare a 'How to' guide defining what constitutes open research data, giving practical examples of the kinds of data that should be preserved and made accessible, and setting out general data management principles.[32] DFID guidance could be prepared in collaboration with other funders and should be made in consultation with researchers and communities in LMIC; it should also point to existing ORD guidance and resources.[33] For instance, the UK Data Service provides guidance on data collection, usage, management and deposit; Jisc has developed a toolkit for Research Data Management; the Australian National Data Service offers extensive resources on data management, licensing, metadata and training. The document should clarify policy requirements and include resources to facilitate their implementation. It should cover legal and ethical issues, the writing of DMPs and DAS, creating datasets, documentation and metadata. The guide could be stored in a dedicated resource page on open research data and open access on DFID website, which could include links to the policy and other relevant documents (internal and external), and a list of FAQs.

Endorse the FAIR principles (I27)

Recent years have seen a growing consensus that open research data should conform to the FAIR Data Principles: that data should be findable, accessible, interoperable and re-usable. The 15 principles are accompanied by a set of 14 metrics, and the European Commission Expert Group on FAIR Data has recently published its final report on Turning FAIR into a Reality. Given their popularity in the research landscape, DFID should consider endorsing the FAIR principles in the revised ORD policy.

Create ORD capacity (I28)

Alongside the set of overarching principles and guidance provided by DFID centrally, additional support should be made available for researchers and SROs at programme level. As discussed above, such support could be provided by DFID staff, at programme level or by external suppliers, as mentioned in section 2.6. For instance, the UK Data Service (UKDS) offers guidance and training in data use and can help develop good practice data preservation and sharing standards

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[32] For example, see: F. Smith, L. Dodds, C. Day et al., *Creating FAIR and open data ecosystems for agricultural programmes,* Gates Open Res 2018, 2:42 – https://doi.org/10.21955/gatesopenres.1114883.1

[33] See: F. Smith, J. Fawcett and R. Musker, *Donor open data policy and practice: an analysis of five agriculture programmes*, F1000Research 2017, 6:1900 - https://doi.org/10.7490/f1000research.1115013.1

at programme as well as organisational level. Arrangements could be made to allow research partners and SROs to draw on UKDS expertise either through formal training or on an ad hoc basis.

Encourage budgeting for data management (I29)

To improve data literacy, DFID should encourage submission of proposals that cost in data managers and data scientists wherever there are programmes over a certain size or which are particularly data-rich. This could be done by updating the Design Section of relevant guidance documents (e.g. Smart Rules for Programme Delivery or the How to note on Writing a Business Case). Data management could be more effectively costed in using UKDS guidelines.

5.4 Improve communication around open research data

Concerns around open research data remain unresolved

Making research data open raises concerns around intellectual property, equity and cultural sovereignty. Many of these concerns are more acute in the context of development research, and additional to widespread challenges around commercial IP, confidentiality and data security. Unless appropriate consideration is given to these issues, these challenges may distort perceptions of the policy and prevent researchers' engagement.

Endorse principles and standards around responsible use of data (I30)

To address concerns around the responsible use of open research data, changes could be made to DFID policy, guidance and communication. It would be beneficial for the new open research data policy to explicitly affirm the principle that research data should be 'as open as possible and as closed as necessary', which has already been endorsed by funders such as the European Commission. The expectation should be that data is made open as soon as possible – the onus is on the researcher or SRO to explain the reasons why data cannot be made open. To help SROs make consistent decisions with regards to the programmes' approach to open research data, DFID could endorse standards that ensure fairness in data sharing and provide clarity as to the expected practice. For instance, the Research Fairness Initiative sponsored by the Council on Health Research for Development (COHRED), provides useful guidance on data ownership, storage, access and use that seeks to address the above concerns.

Define the criteria for the delayed deposit of ORD (I31)

Secondly, there is a need for clear articulation of the criteria surrounding necessary restrictions on access. One such criterion relates to delayed release of open research data: the revised policy

could continue to permit delayed deposit of research data within one year after the completion of a project or programme, to give researchers enough time to publish using their proprietary datasets. Further criteria and good practice can be found in the Research Fairness Initiative's reporting guidance (see the relevant section on right of reuse of data for publication). We further recommend that the principles for responsible data use are reflected in contracting practices. To this end, good practices and tools are also available on COHRED's Fair Research Contracting page. Other initiatives looking at responsible data use are the Open Data Institute's Data Ethics Canvas and the Responsible Data community of practice.

5.5 DFID has no preferred or recommended data repository

DFID currently does not operate or recommend a repository for research data	The current policy requires DFID-funded researchers to deposit their data in an "established discipline or institutional repository". However, DFID does not provide a data repository nor any clear guidance on how to identify and deposit in appropriate data repositories.

Recommend the use of certified third-party repositories (I32)

Some development funders have elected to develop proprietary data repositories. For instance, USAID's open research data policy requires implementing research partners to submit research and underlying datasets to the Development Data Library (DDL), in machine-readable format. Published datasets also appear on Data.gov. We do not recommend that DFID develops its own data repository, but the open research data policy could recommend that researchers use trusted third-party repositories, with a preference for those complying with the CoreTrustSeal certification. The accompanying guidance should provide examples of discipline-specific repositories that comply with international standards (as an example, see this list of data repositories that meet the standards set by the SpringerNature Data Journal). Alternatively, DFID could also recommend use of a partner repository like the UK Data Archive to deposit data that cannot be easily stored in discipline or generalist repositories. The UK Data Archive already provides a unified point of access to the data produced by ESRC-funded research.

5.6 Data availability statements are not consistently provided

Most DFID scholarly articles do not have data availability statements

Data availability statements (DAS) disclose where, how and subject to what limitations the data supporting the results reported in a published output can be found. The OA policy requires that

"All published results must include information on how to access original, raw datasets."

However, the majority of research articles assessed in our review do not have a DAS.[34]

Publish guidance on preparing a DAS (I33)

The OA policy makes clear that all research data produced and shared in the context of DFID-funded projects should be within the scope of the policy, and this should be carried forward in the revised open research data policy. DAS should be required regardless of the format of the final project output, i.e. both journal articles and grey literature should include a clear data access statement wherever relevant. The revised ORD policy should also include information on preparing data availability statements (DAS). DAS disclose where data supporting the results reported in a published output can be found and how they can be accessed. Particular attention should be paid to practical constraints to accessing large databases. DAS are also important when the data cannot be made available or when restrictions apply, and guidance should help researchers determine what exceptions to the open research data requirement are applicable in the specific case (see, for instance, IP and open access in section 3 above). The guidance should also define a standard format and position of the DAS, to be used wherever possible. For instance, DAS could be included in a dedicated section on Data citations, and it should include either a hyperlink to a publicly archived dataset or the contact details of the data manager. SpingerNature has published some useful guidance on data availability statements.

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[34] We reviewed DAS for the 163 open access journal articles produced by the selected DFID programmes (see interim report). We found that 23 do not need a statement (e.g. because they are literature reviews), 46 have a statement and 94 have no statement. Please see the interim report for more details.

5.7 Many programmes lack Access and Data Management Plans

Access and Data Management Plans are not being prepared	DFID policy requires that Access and Data Management Plans (ADMP) are appended to a programme business case and makes provision for their assessment in competitive tendering processes. However, the template provided for those plans does not conform to current good practice. Moreover, most of the research outputs reviewed in this study did not have an ADMP (see Appendix III), whilst others used data management plans templates from other funders.

Review and improve the ADMP template, and link to appropriate guidance (I34)

The ADMP template included as an appendix to the OA policy should be revised to incorporate elements from best-practice data management templates. The Digital Curation Centre offers examples and extensive guidance on how preparing a data sharing and management plan. DFID could also look at using the UKDS data management template as a model for social science data. This considers issues such as: assessment of existing data; information on new data; quality assurance; security and back-up; management and curation; difficulties in data sharing and measures to overcome them; consent, anonymization and re-usability; copyright, IPR and licences; and responsibilities for data sharing. UKDS also produced accompanying guidance for each of the above points that could be adopted or referenced by DFID. The Wellcome Trust's DMP template also requires information on: appropriate repositories and other services; the software used in creating and analysing the data; arrangements to ensure discoverability; and precise arrangements for access. If the ultimate aspiration of the ADMP is that data assets are made available for reuse in other development activities, then the ADMPs should help identify what data could be reused and how data discoverability could be maximised.

Require the production of ADMP throughout the programme (I35)

The OA policy states that "usually, a Plan […] will form part of the business case for the project", which falls short of an explicit requirement. The revised policy could make it a mandatory requirement that the ADMP be appended to the business case for research programmes. This is in line with national and international good practice, where DMPs are required as part of the grant application. The new policy could also mandate that revised ADMPs be appended to Annual Review documents and project completion reports.

6. Strengthening monitoring tools and processes

Summary

DFID lacks appropriate monitoring tools and processes for open access. There seems to be no standard process to assign responsibilities for OA and open research data, or to capture and report compliance within a programme. Reporting and monitoring tools can be used to support compliance, building on a clearer set of processes and responsibilities.

6.1 Introduction

Standardizing the monitoring processes

Our review has highlighted the lack of a clear and systematic monitoring process for the OA policy. Whilst there is general agreement that responsibility for monitoring compliance rests with Senior Responsible Owners, no mechanisms are in place to assist them. Of the 10 DFID programmes included in this review, six were able to provide the list of publications produced to date, three did not provide a list of publications and one programme had to request it from the partnering funder. The publication lists did not follow a standard format and several outputs were reported incorrectly (i.e. the metadata was partial or inaccurate). Moreover, the absence of publication titles in the annual reviews made it difficult to track existing publications. A number of improvements can be made to standardise policy monitoring processes:

- **Metadata**: Researchers include programme metadata in all outputs (ARIES number and programme name).
- **Annual reviews**: Researchers communicate outputs to the SRO/programme manager, for inclusion in annual reviews.
- **Repository**: Relevant DFID staff upload publications in a compliant repository.
- **Monitoring and communication**: Relevant DFID staff use automated tools to monitor the OA status of the publications, highlight non-compliance and remedies it where possible or suggest follow-on actions.

Fig 5. Changes to monitoring in the programme lifecycle

6.2 Clarify responsibilities for open access

Responsibilities for supporting OA are ill-defined	We understand that responsibility for implementing the OA policy sits primarily with the Programme Director / Principal Investigator, consistent with the Research Uptake Guidance. By contrast, Senior Responsible Owners are responsible for ensuring that contractual obligations are met and relevant organisational policies are respected. However, the consultation revealed a lack of clarity around the specific responsibilities to implement the various aspects of the policy. For instance, in some cases SROs failed to meet their responsibility to upload research outputs in R4D. Moreover, it is unclear to what extent an SRO can monitor and enforce the requirement of the open access policy when these are not reflected in the contract (see section 2.4).
Assign responsibilities for open access (I36)	Responsibilities for specific tasks related to the implementation of the OA policy within a programme should be defined more clearly by the programme team at the beginning of the programme. For instance, coordination and monitoring roles within a programme could be assigned to the Configuration Manager or the Governance and Reporting Manager.[35] If the responsibility is delegated to an intermediary organisation (e.g. consultants), a DFID member of staff should provide a direct line of accountability for the intermediary.
Support and train DFID staff (I37)	Internal support and training opportunities should also be available for DFID staff and intermediary organisations working to implement the OA policy within a programme. If internal OA support is created, a meeting or series of meetings should be organised with programme staff and suppliers to clarify roles, responsibilities and processes related to OA and to data. This can be done at programme initiation, as part of the discussions that accompany the development of the Logframe, as well as during annual reviews.

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[35] For more information about these and other relevant programme-level roles, see DFID's Project Capability Delivery Framework

6.3 Programme information in funding acknowledgements

Programme metadata is not included in funding acknowledgements

There is no automated way to track what research outputs have been produced by a programme. The Open and Enhanced Access policy requires that all written outputs acknowledge DFID funding, and encourages non-written outputs do the same. It states that the following acknowledgement should be used in or associated with all written outputs and associated metadata:

"This work was supported by the UK Department for International Development [insert project title and Aries number]".

However, many outputs do not contain this acknowledgement, and neither programme name nor Aries number are contained in R4D metadata. This makes it difficult to systematically track and monitor programme outputs, especially using automated systems.

Update contract template (I38)

The 2017 template for Accountable Grants only requires recipients to "explicitly acknowledge DFID's funding, in written and verbal communications about activities related to the funding, to the public or third parties". However, neither this document nor the accompanying DFID Branding guidelines require the insertion of the programme title and Aries number. DFID could review the grant agreement provision to mandate that recipients:

"Explicitly acknowledge DFID's funding, in written and verbal communications about activities related to the funding, to the public or third parties; such acknowledgement must make reference to the title and Aries number of the relevant project or programme to facilitate monitoring"

This will make it easier to retrieve programme outputs and monitor open access compliance using automated solutions (see section 6.5).

6.4 Improve output reporting in annual reviews

Annual reviews do not include a list of publications

There is currently no systematic process for researchers to report, and DFID to capture, publications produced during a research programme. Annual reviews (AR) use a 5-point scoring system to measure actual achievements against the outputs set out in the logframe, including the number of publications produced and made open access in a given year. However, SROs/programme managers are not expected to submit a list of publications, making it very difficult to identify the publications and verify their accessibility.

Include research outputs in AR (I39)

DFID guidance on Reviewing and Scoring Projects indicates that the annual reviews (AR) and project completion report (PCR) are the tools used to monitor progress towards meeting the objectives set out in the logframe. If open access is included in the list of logframe outputs,[36] AR and PCR should provide all the information to allow monitoring that outputs have been delivered. DFID could add an appendix to the annual review template requiring SROs to list the research outputs (including peer-reviewed and non-peer-reviewed publications, data, presentations, multimedia files etc) that have been produced by the programme. The list should match the quantitative information provided in section C (Detailed Output Scoring), and it should include metadata about the publication and a link to the file (preferably using DOIs). Alternatively, outputs could be listed in ResearchFish, which is currently being used in health-related research programmes within DFID and includes a field on the OA status of publications.

6.5 Use dedicated tools for reporting and monitoring

DFID lacks the capacity and capability to monitor compliance with its policy

DFID currently lacks capacity independently to monitor what research outputs have been produced by a programme and whether these are open access. It relies on voluntary reporting by its suppliers, or information provided by other donors, which can be partial. No independent monitoring is carried out to ensure all outputs are being reported.

Expand the use of ResearchFish (I40)

We recognise that it may not be possible for DFID to improve the features of R4D, which is managed centrally by the Government Digital Service. If changing the function and functionality of R4D from 'finder' to research repository and monitoring system is difficult, DFID could use third-party software for monitoring purposes. We understand that some DFID programmes are already using ResearchFish, but that adoption is still limited. ResearchFish is a research assessment platform where researchers can record their publications and attribute them to a specific grant. DFID could require the use of RF for reporting across an increased proportion of its research programmes, as a complement to the annual reviews.

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[36] A note on terminology - DFID defines outputs as the products or services delivered; this includes research products but also research dissemination, hence open access.

Use web-scale discovery tools (I41)

As a supplement to the use of ResearchFish for monitoring, DFID can use search-based global databases as monitoring tools that do not rely on reporting by researchers. This solution does not require any alteration of existing researcher workflows, as these databases already hold UK and global information about publications and related grants, funders, impact, and more. The market offers a few solutions, including 1Science, Wizdom.ai and Dimensions.ai. The text box below discusses a tool that can be used to monitor all types of outputs produced by DFID. This software collects and processes publications, grants and related data (citations and impact metrics, disambiguated authors, institutions, countries, publishers, journals, funders, grants) in a structured process. It then delivers a homogenous and quality-assured relational database with systematic and consistent inclusion of funder, grant or programme information in research outputs.

Case study: Monitoring OA compliance using Dimensions.ai

Dimensions.ai is a research data platform that lets users explore the connections between grants, publications, clinical trials, patents and policy documents. The software offers the possibility to search for each type of output by research funder name, field of research, grant number, programme name, author name, institutions and other classifiers. For each publication, research organisation or funder, Dimensions.ai shows publication and citation data, as well as the open access status of an output.

Dimensions.ai includes over 128 million interlinked documents, of which almost 100 million publication records, 4.2 million research grants, 37 million patents, almost 450,000 clinical trials, and some 350,000 policy documents. The bringing together of grants, publications, clinical trials, patents and policy documents consistently linked and contextualised, would allow DFID to monitor the impact of its research, its compliance with the OA policy, and developments in its domains and among its peers. Access to citations and altmetrics would also give additional information on the impact of DFID-funded research.

In order to make full use of the software, DFID would need to purchase a licence and supply grant information. The software can be set up to perform monthly reports to verify programme and author compliance with the OA policy.

7. Setting priorities for DFID

Summary   **The review identifies 41 opportunities for improvements, organised in five thematic areas. This section provides a summary assessment of each improvement based on its impact and ease of implementation. It uses quadrant analysis to display cost-effectiveness and identifies priorities for DFID moving forward.**

Understanding the recommendations

The review identifies 41 opportunities for improving DFID's Open and Enhanced Access Policy. Each opportunity can require a change to the policy itself, to the related guidance documents or to relevant tools and processes affecting implementation. Our approach has taken into account, and to some extent has been informed by, international good practice as well as our understanding of the practical limits and constraints faced by DFID in changing its internal practice.

We further recognise that implementing all the improvements presented in this document will be impossible, and that DFID will therefore need to prioritise those actions that have the greatest impact at the lowest possible cost. This section presents a cost-benefit analysis of each improvement (see overleaf) based on two criteria:

- **Benefit**: the extent to which the recommendation has a clear, significant and direct impact on policy effectiveness
- **Cost**: the extent to which the recommended course of action presents financial or non-financial costs to the organisation.[37]

The improvements that have been identified as priority under each section are shown with a red dot in the relevant figures, and briefly discussed in the text. A further prioritisation is then suggested in the conclusions.

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[37] For instance, an action may have no direct financial cost but it may require changes to DFID's practice that are time-consuming or practically challenging in the short term.

**Fig 6. Cost-benefit analysis of actions to embed OA**
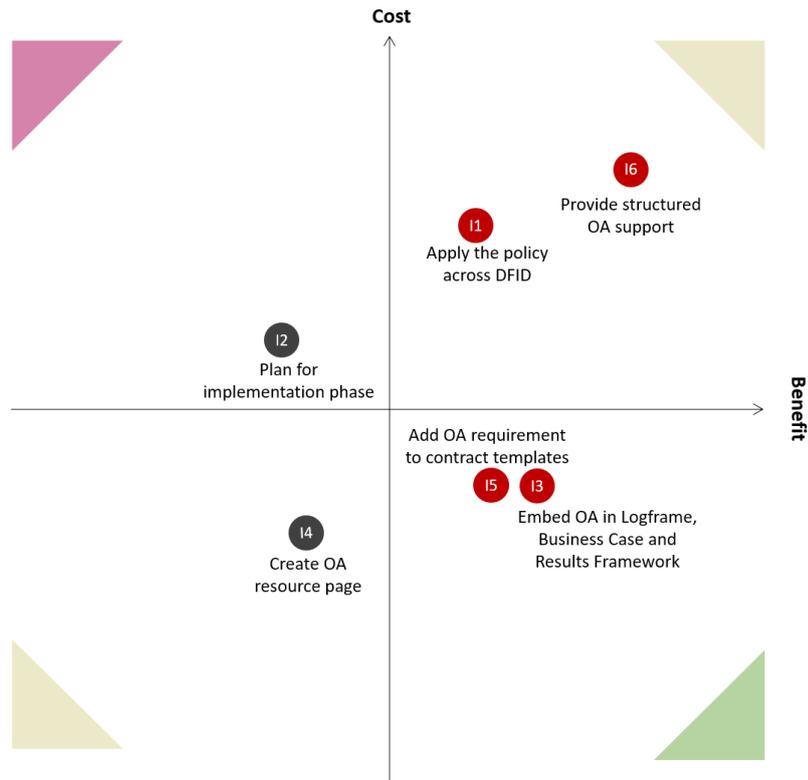
In order to embed OA and ORD in its research activity, DFID should prioritise the following actions:

- I1: Expand the scope of the policy to non-RED programmes, planning for a phased implementation period (high benefit, high cost);
- I3/I5: Update the contract or grant agreement template and relevant programme documents to include OA/ORD requirements (medium benefit, low cost);
- I6: Create open access and open research data support, preferably at the central level (high benefit, high cost).

To complement the above, another opportunity for improvement worth considering is the following:

- I4: Create a dedicated OA/ORD resource page on its website (medium benefit, low cost).

Fig. 7 – Cost-benefit analysis of actions on peer-reviewed outputs
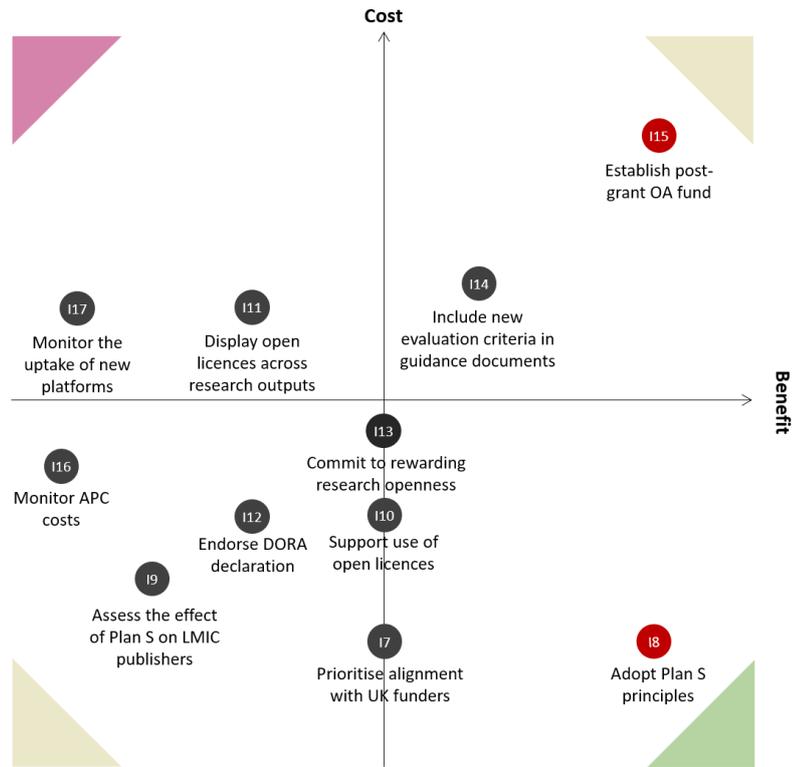
Open access to peer-reviewed outputs

In order to improve open access to peer-review publications, DFID is called upon to align its requirements with the fast-moving policy landscape and better motivate and support authors. The following key actions are thus identified as high priority:

- I8: Endorse Plan S (high benefit, low cost[38]);
- I15: Establish a post-grant OA fund (high benefit, high cost).

Two additional actions have been identified as medium priority:

- I10: Support the use of open licences (medium benefit, medium to low cost);
- I13: Adopt and communicate an evaluation framework that rewards research openness (medium benefit, medium cost).

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[38] We refer here only to the cost of endorsing the Plan S principles *on paper* (e.g. discussing, deliberating, drafting a statement and/or compliant policy etc) not of implementing it in practice. Implementing Plan S will naturally require more costly actions, many of which have been discussed at length in sections 3, 4 and 6 of this report.

Fig. 8 – Cost-benefit analysis of actions on grey literature
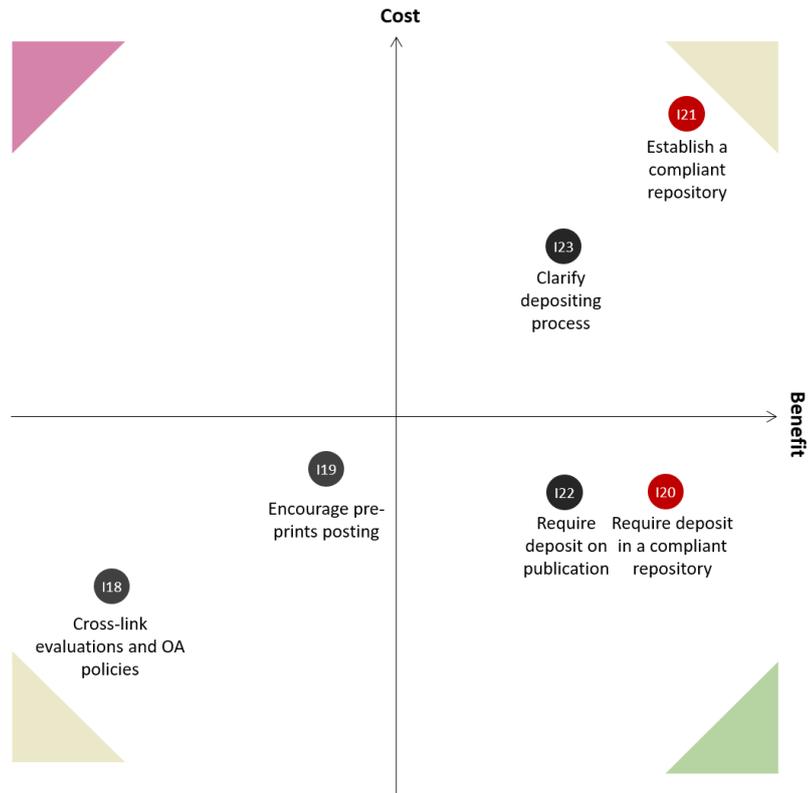
Open access to non-peer-reviewed outputs

Increasing the accessibility of grey literature outputs will depend on the extent to which DFID improves the depositing process. The following actions have been identified as priority:

- I20: Require a deposit of all outputs in the compliant repository upon publication (high benefit, low cost);
- I21: Establish a compliant repository (high benefit, high cost).

Additionally, DFID should also consider the following actions (medium priority):

- I23: Clarify the depositing process (medium benefit, medium cost).

Fig. 9 – Cost-benefit analysis of actions on open research data
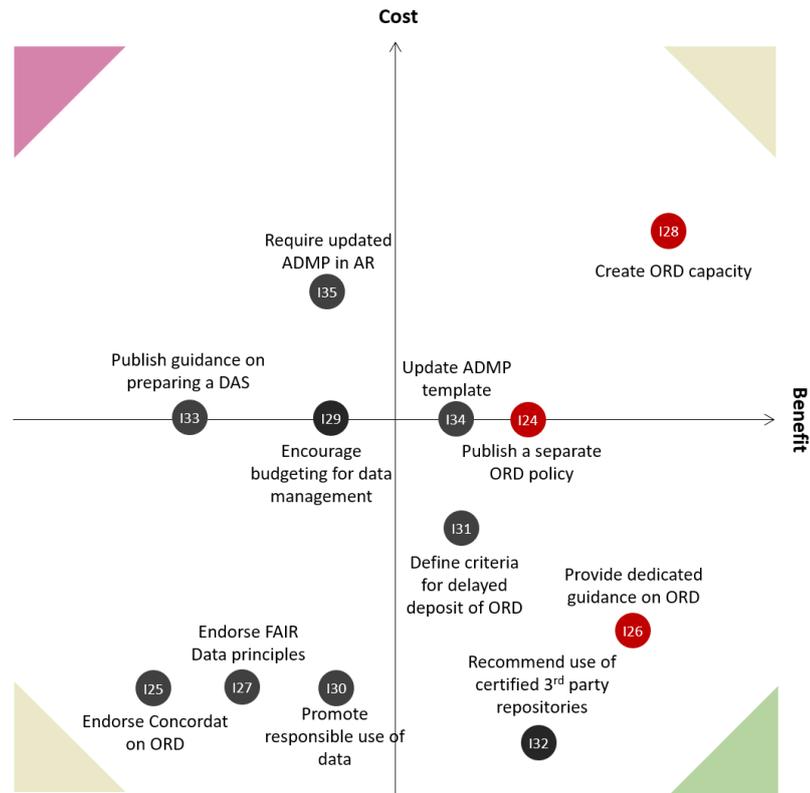
Open research data

In order to improve access to research data, a range of ambitious actions will be necessary. Among these, we recommend that the following are prioritised:

- I24: Publish a separate ORD policy linked to the OA policy (medium benefit, medium to low cost);
- I26: Produce dedicated guidance on ORD, including the criteria for delayed deposit of ORD (high benefit, low cost);
- I28: Create additional ORD capacity, centrally and/or within programmes (high benefit, high cost).

Medium priority actions on research data are:

- I29: encourage submission of proposals that cost in data managers and data scientists wherever there are programmes over a certain size or which are particularly data-rich (high benefit, high cost);
- I32: Encourage the use of certified 3rd party data repositories (medium benefit, low cost).

Fig. 10 – Cost-benefit analysis of monitoring actions

Cost

I37
Support and train
DFID staff

I36
Assign responsibilities
for OA

I39
Include research
outputs in AR

Benefit

Update contracts
with ARIES
requirement

I38

Use web-scale
discovery tools

I41

Extend use of
ResearchFish

I40
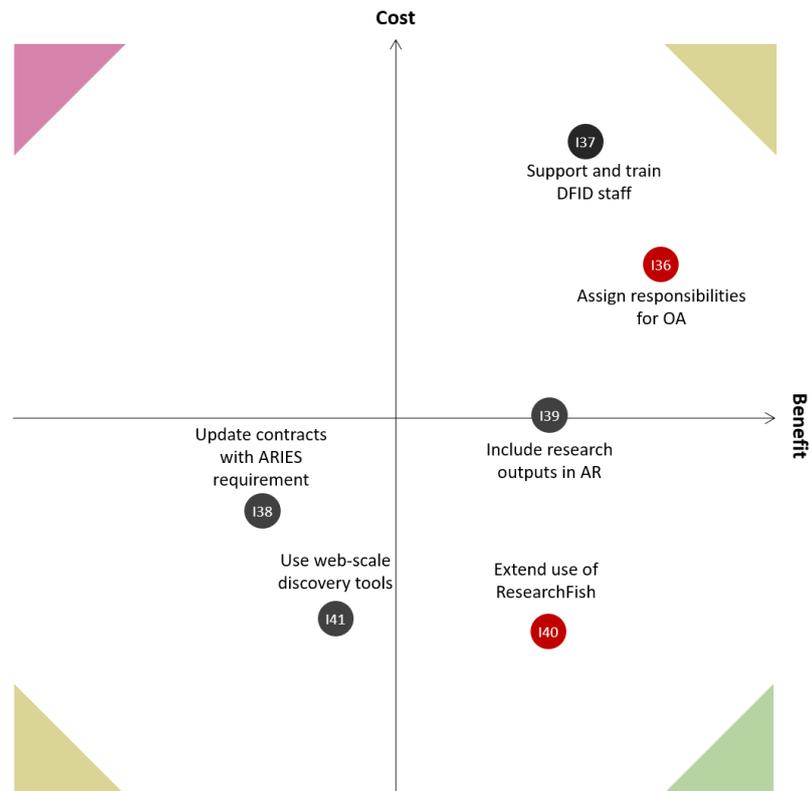
Monitoring tools and processes

DFID currently lacks a system or process to monitor compliance with its open access policy. To improve the effectiveness of the policy DFID is therefore called upon to put in place appropriate monitoring actions. In particular, we recommend that priority is given to the following:

- I36: Clarify processes and responsibilities for OA/ORD within programmes (high benefit, high cost)
- I39 - I40: Establish a monitoring process based on either the inclusion of publication data in Annual Reports or the use of ResearchFish across all DFID-funded programmes (medium to high benefit, medium to low cost).

Additionally, DFID could also consider the following action as medium priority:

- I37: Support and train DFID staff on the benefits of the OA/ORD policy and on positive actions to promote its implementation (high benefit, high cost);

8.   Conclusions

The review has highlighted a range of opportunities to improve DFID's Research Open and Enhanced Policy. We recognise that some of these actions are ambitious and that it may not be possible to implement all the recommendations. The trade-offs between ambition and cost-effectiveness have been explored in section 7. The table below sets out ten **key recommendations**. These are high-priority actions arising from this review, assessed based on their likely benefit and cost.

Table 4. List of 10 key recommendations arising from the review.

Key recommendation	Cost	Benefit
Endorse the Plan S principles and join cOAlition S (I8)	Low	High
Establish/choose a Plan S-compliant repository (I21) and require deposit upon publication (I20)	Medium	High
Include OA/ORD requirements in key guidance documents and contract/grant templates (I3/I5); ensure that such documents clearly define processes and responsibilities for OA/ORD, especially at programme level (I36)	Medium	High
Provide structured support to help SROs and researchers understand, implement and monitor OA and ORD policy requirements (I6/I28)	High	High
Establish a mechanism to enable payment of Article Publication Charges after the end of a programme (I15)	High	High
Publish independent and interlinked policies & dedicated guidance on OA and ORD (I24/I26)	Low	Med-High
Ensure that all programmes classified as research fall within the scope of the OA and ORD policies (I1) and are adequately monitored (e.g. by including publication data in Annual Reports (I39) and/or using output reporting software (I40))	Medium	Med-High

Investing in open access to research

We understand that the implementation of these recommendations will be influenced by cost considerations, including the political capital necessary to effectuate changes across the organisation. DFID is a development organisation that spends only 3% of its budget on research, and therefore it cannot be expected to dedicate the same resources to open access and open research data as a research funder. However, it is clear that open access supports and enhances DFID's mission and objectives, as it is being increasingly recognised by other development donors. It is important that DFID invests in making research open in a way that respects and protects stakeholders in the Global South. This is likely to yield long-term benefits not just to our understanding of the problems affecting stakeholders in LMIC but ultimately to their own ability to find appropriate solutions to such problems.

Appendix I. List of Interviewees

Table 5. List of interviewed stakeholders

Name of interviewee	Affiliation
Aimee Nixon	Emerald Publishing
Alastair Ager	Department for International Development
Andrea Powell	International Association of STM Publishers
Ashley Farley	Bill & Melinda Gates Foundation
Bjorn Hassler	University of Cambridge
Bo Alroe	Digital Science
Eilidh Simpson	Department for International Development
Eric Archambault	1science
Frances Sibbet	Department for International Development
Inesa Thomsen	UK Department of Health
John Adams	Department for International Development
Kim Bradford Smith	Department for International Development
Lars Bjørnshauge	Directory of Open Access Journals (DOAJ)
Liz Allen	F1000
Louise Corti	UK Data Service (UKDS)
Lynne Henderson	Department for International Development
Martin Parr	CABI
Matthew Harvey	Department for International Development
Matthew Wallace	IDRC
Max Hastings	Universities UK
Nilam McGrath	University of Leeds
Nupur Barua	Department for International Development
Pauline Rose	University of Cambridge
Robert Kiley	Wellcome Trust
Rona Bronwin	Department for International Development
Sian Harris	INASP
Sian Rasdale	Department for International Development
Sue Kinn	Department for International Development
Tracey McGinley	Department for International Development
Wayne Williams	UK Research and Innovation (UKRI)

Appendix II. Glossary

Article Publication Charge (APC)	A single payment made to the publisher to make an output open access. This does not guarantee that the author retains copyright or that a publication is made available under a Creative Commons licence.
Author's Accepted Manuscript / Post Print / Accepted Version (AAM)	The author's final, accepted manuscript is the one that has been agreed with the editor at that point. The accepted manuscript is not the same as the copy-edited, typeset or published paper – these versions are known as 'proofs' or 'versions of record' (VOR) and publishers do not normally allow authors to make these open access.
CC – Creative Commons	A free public copyright licence that enables the free distribution of an otherwise copyrighted work. A CC licence is used when an author wants to give people the right to share, use, and build upon a work that they have created
CC-BY – Attribution	Licensees may copy, distribute, display and perform the work and make derivative works and remixes based on it only if they give the author or licensor the credits (attribution) in the manner specified by these.
CC BY-NC – Attribution-Non-Commercial	This licence lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms.
CC BY-ND – Attribution-Non-Derivative	This licence allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to you.
CC BY-NC-ND - Attribution-Non-Commercial-Non-Derivative	This licence is the most restrictive of the six main licenses, only allowing others to download your works and share them with others as long as they credit you, but they can't change them in any way or use them commercially.
CC BY-SA – Share-Alike	Licensees may distribute derivative works only under a licence identical ("not more restrictive") to the license that governs the original work. I.e. without share-alike, derivative works might be

sublicensed with compatible but more restrictive licence clauses, e.g. CC BY to CC BY-NC.

CC0 – Public domain	Creative Commons Zero is a way to release work through to public domain, i.e. all rights expired.
Delayed OA	Articles made accessible on the publisher's platform at a defined time after publication, typically less than 24 months.
Enhanced access	Steps taken to help users find, view and download materials.
File sharing	Includes websites with filesharing as their primary purpose such as Figshare, Docsford, Docslide, doc88.com and journal-dl.com.
General Public License (GPL)	A free software license, which guarantees end users the freedom to run, study, share and modify the software.
Gold – APC	Articles in fully-OA journals that charge an APC.
Gold – no APC	Articles in fully-OA journals that do not charge an APC.
Gold – Hybrid	Articles made available OA by payment of an APC to a journal that is fully available only on subscription (hybrid journal).
Gold or immediate OA	Articles that are freely accessible on the publisher's platform immediately upon publication.
Green OA	The posting of a version of a published article so that it is accessible via a website, institutional or subject repository, scholarly collaboration network or other service.
Grey literature	Materials and research produced by organisations outside of the traditional commercial or academic publishing and distribution channels. This includes, but is not limited to, reports, conference papers, policy briefs and working papers.
Hybrid-subscription	Articles in hybrid journals available by subscription
Institutional repository	An online archive from a university or other research institution
Open access (OA)	Irrevocable and free online access by any user worldwide to fulltext/full version scientific and scholarly material ('outputs')

Open Government Licence (OGL)	A copyright licence for Crown Copyright works published by the UK government. Other UK public sector bodies may apply it to their publications. It was developed and is maintained by The National Archives. It is compatible with the Creative Commons Attribution (CC-BY) licence.
Open research data (ORD)	Research data that can be freely used, re-used and redistributed by anyone – subject to the requirement to attribute and share-alike
Overseas Development Assistance (ODA)	ODA – commonly known as overseas development aid – is when support, expertise or finance is supplied by one government to help the people of another country. ODA is used by the UK Government in the UK to deliver its 2015 Aid Strategy.
Preprint	A version of a scholarly or scientific paper that precedes publication in a peer-reviewed scholarly or scientific journal. The preprint may be available, often as a non-typeset version available free, before and/or after a paper is published in a journal.
Programme website	Websites and pages controlled by DFID or partner organisations, and which are used to present information related to the research programme
Research	A wide range of activities designed to generate primary and secondary empirical data to inform DFID's work and as a global public good ('projects'). This includes most of the work commissioned through DFID's central research funds as well as research commissioned by other units within DFID.
Research data	The evidence that underpins the answer to a research question and can be used to validate findings regardless of its form (e.g. print, digital, or physical)
Research and Evidence Division (RED)	DFID's Research and Evidence Division is responsible for making DFID more systematic in using evidence as a basis for how best to reduce global poverty, and provide high quality relevant evidence through commissioning research on key questions in development, robust evaluations of DFID's programmes, high quality statistics, active engagement with policy makers and strengthening DFID's professional cadres
Research Quality Plus (RQ+)	A flexible approach for evaluating the quality of research for development which embraces a broad definition of research quality that includes scientific rigor but also recognizes other critical

dimensions. RQ+ takes contextual factors into consideration, includes customizable assessment rubrics, and promotes the use of empirical evidence to inform expert evaluations of research quality.

Subscription-based Journals and articles that are accessible on the publisher's platform only on payment of a subscription.

Social Sharing Network or Scholarly Collaboration Network Services that facilitate collaboration and the sharing of documents between researchers. Examples include ResearchGate, Academia.edu, and Social Science Research Network

Subject Repository An online archive for collecting, preserving, and disseminating digital copies of articles and other content produced by scholars in a particular area. Examples include PubMedCentral and Research Papers in Economics (RePEc).

Subscription only Articles in subscription journals

Version of Record (VOR) The copy-edited, typeset and published academic output.

Appendix III. Policy performance in selected programmes

Review of performance

The first part of the study reviewed a total 11 research programmes from DFID's Research and Evidence Division (RED).

Table 6. List of selected programmes

Programme name	RED Team
Systematic review and research mapping programme South Asia	South Asia Research Hub
Strategic Research and Evidence for the East Africa region	East Africa Research Hub
Ant- Corruption Evidence (ACE)	Governance Conflict Social Development
Promoting cooperation and avoiding conflict in managing the impacts of climate change (CCMCC)	Climate
Clinton Health Access Initiative Expansion of Demand-Driven Evaluations for Decisions	Evaluation
Neglected Tropical Diseases Implementation Research Programme (NIRP / COUNTDOWN)	Health
Joint initiative with ESRC to build evidence on what works to raise learning outcomes in developing countries	Education
Zoonoses and Emerging Livestock Systems: reducing the risk to livestock and people	Agriculture
Enabling Innovation and Productivity Growth in Low Income Countries (EIP-LIC)	Growth
Global Open Data for Agriculture and Nutrition (GODAN)	Data 4 development
Research Programme Consortium on Leveraging Agriculture for Nutrition in South Asia (LANSA)	Agriculture

Current access to DFID research

About two thirds of the 569 research outputs discovered in our work are classified as grey literature, i.e. non-commercial publications such as reports, briefs and other documents. By contrast, just over a quarter of the outputs are journal articles, while books and data sets each represent only 2%. This distribution will not be reflective of the true picture, with a much higher proportion of datasets being produced, in particular, than are currently discoverable online.

**Fig. 11 - Research outputs from 11 DFID programmes (n = 569)**
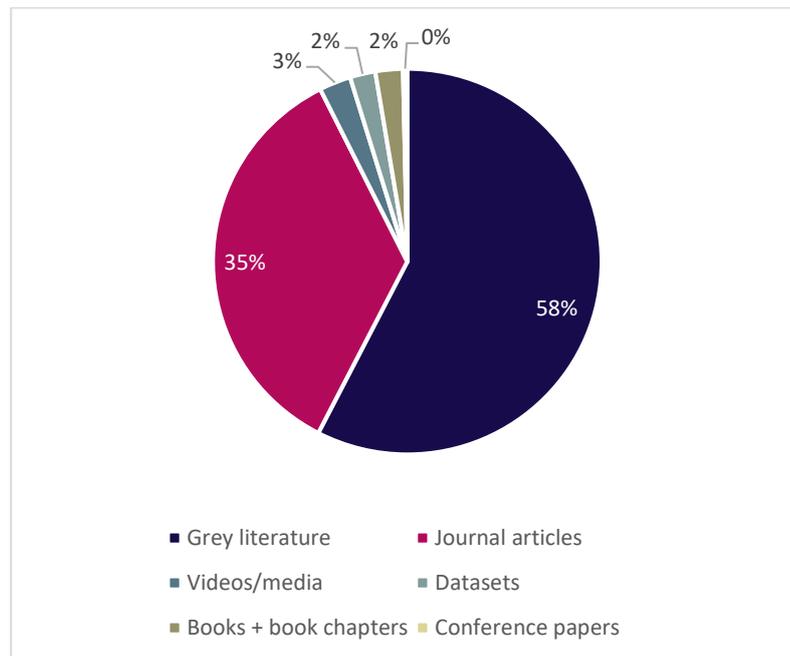
Because DFID's grey literature outputs are publicly available and grey literature is the most common form of literature, most research outputs identified from our work are free to read online.[39] Three quarters of the written outputs reviewed acknowledge DFID funding, although they use inconsistent terminology (UK Aid, DFID, UK Government etc).

While DFID grey literature research is free to read, that is not the same as saying that such research is open access. Of the 327 grey literature outputs analysed, 55% lack a licence which limits re-use or at least creates uncertainty over re-use rights. There is a clear opportunity for DFID to strengthen open access by encouraging authors to simply add a licence to all published outputs. For consistency, we recommend using a standard licence, such as Creative Commons (CC) or Open Government Licence (OGL).

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[39] It is important to note the potential circularity of this finding, in that outputs not made available online were unlikely to be identified via our methodology. We will undertake further work in subsequent phases of the project to understand the extent to which outputs are being produced, but not made public. However, any evidence gathered is likely to be anecdotal in nature.

We found that approximately two-thirds (71%) of the journal articles published by the selected programmes are open access. This is higher than the overall UK average in 2016 (54%), but lower than that for research funded by Research Councils UK (RCUK). When looking at the 2016-2017 period, the overall share of articles made open access from the selected programmes was slightly higher (75%), while the proportion of articles made immediately open access (Gold OA) kept rising over the years the OA policy was in force (from 60% in the 2013-2016 period to 74% in the 2016-2017). However, overall compliance across the organisation is likely to be lower due to the selection bias affecting the sample (see section 2.4) and the fact that the review does not cover outputs that are published after the end of a programme, for which there is no support.

Fig. 12 - Proportion of OA articles across funders (DFID = n118)[40]
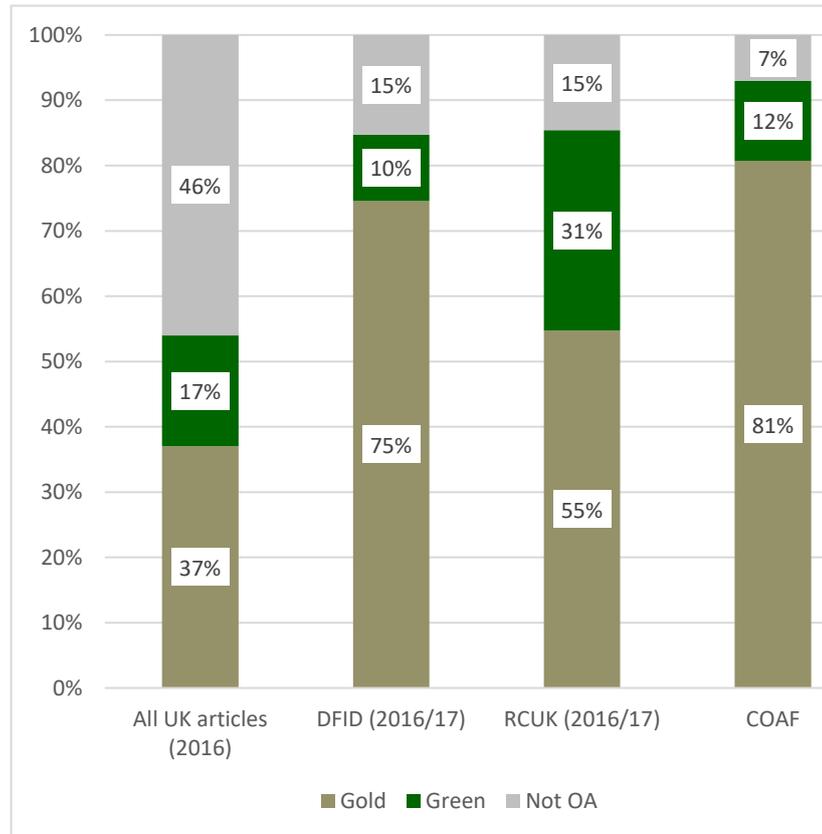
Accessing DFID research on R4D

DFID's open and enhanced access policy was written when a different R4D site and functionality existed. When R4D moved from DFID to GOV.UK management, new R4D guidance was written but the open access policy was not updated. Open access policy and R4D guidance are therefore no longer in sync. For example, while the OA policy puts the

responsibility to SEND outputs or metadata for upload on R4D firmly on the researcher, R4D guidance states that the decision of whether and what to upload is collectively taken by the DFID research team. Inconsistencies between policies are likely to confuse researchers and must be resolved.

While most research publications are at least free to read, DFID's policy also mandates that they are made easily accessible. Enhanced access includes, at the very minimum, depositing research outputs R4D as well as to make them available in other digital platforms, as appropriate, in formats that are easily accessible by the intended audience.

We looked at the number of research outputs deposited on R4D and found that grey literature makes up around two thirds of the total, while academic articles account for almost one third. Datasets, books, conference proceedings and other media files account for 2-5% of total outputs. Figure 13 shows that the number of outputs in R4D with publication dates from 2015 onwards is significantly lower than earlier years. This would suggest that deposit frequently occurs many years after publication, if at all, compromising R4D's value as an up-to-date repository of DFID-funded research.

Fig. 13 – Number of outputs on R4D by year of publication
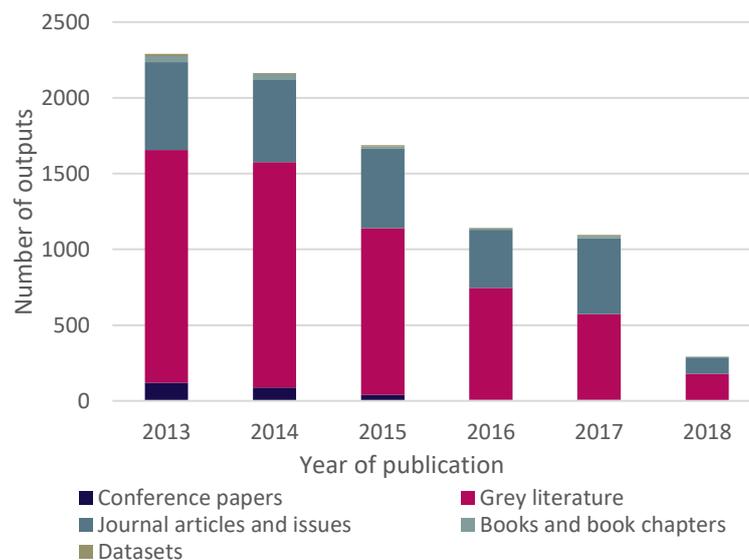
DFID's open access policy requires researchers to deposit metadata for all research outputs on R4D on or before publication, and it further mandates that the full text of grey literature outputs is deposited as soon as it is feasible to do so. At any given time, therefore, metadata for all research publications should be on R4D and most of it should be available to download on R4D. However, our analysis of programme outputs found that R4D only contains 57% of grey literature, 44% of journal articles (in either metadata or full-text format) and 26% of

non-written outputs.[41] Moreover, output discoverability on R4D is hampered by limited search functionality.[42] Even considering the discretion awarded to research teams under R4D guidance, the proportion is low and contrary to the objectives of the policy.

Fig. 14 - Are research outputs in R4D? (n = 569)
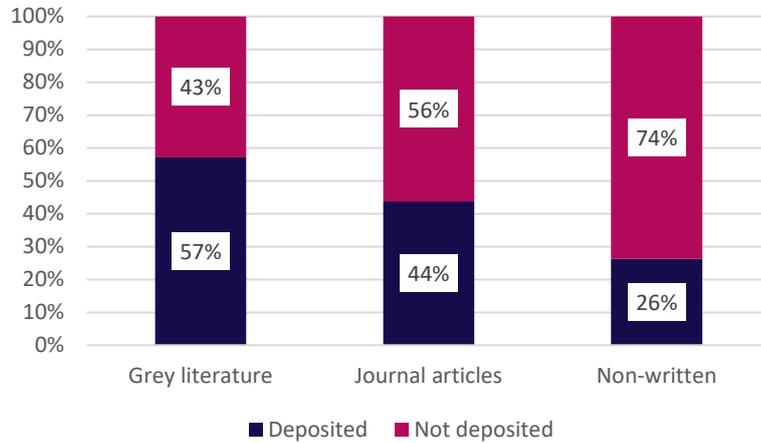
Internal evaluations (such as annual reviews) are generally available on DevTracker. Only one of the 11 programmes did not have annual reports available on the site. These are generally available on R4D, but hardly discoverable since the metadata does not contain any information about the programme they refer to.[43] R4D contains 341 evaluation reports, but we were unable to determine what programmes these reports referred to. Although none of the donors' policies mentions evaluations directly, USAID's repository (Development Experience Clearinghouse or DEC) has a dedicated site for evaluation outputs and specifics requirements to deposit there as part of the USAID evaluations toolkit.

R4D's aim is to make available to the public, in one place, DFID funded research outputs. It is not a repository, and lacks a number of functions offered by the repositories in use by other research and development funders (see Table 7 below).

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[41] R4D does not accept non-written outputs, hence it hosts only metadata links to original datasets and media files.

[42] R4D does not return outputs searched by programme name (output metadata does not include information on programmes), while it returns too many results using keyword search.

[43] Annual reviews deposited on R4D have no title nor authors, making them hard to find. A typical title would be "Annual review (4) 203089 (Published - July, 2016)", which contains no keyword related to a programme, country or topic.

Table 7. Comparison between the R4D 'finder' and selected funder repositories

	R4D	IDRC Digital Library	Open Knowledge Repository	Europe PMC	IRIS	Development Experience Clearing House
Funder	DFID	IDRC	World Bank	29 research funders, across Europe[44]	WHO	US AID
Software platform	Supplied by the Government Digital Service	DSpace	DSpace	Custom	DSpace	Inmagic® Presto
Number of records	~35,000	54,620	27,112	34.4 million abstracts, 4.9 million full-text	219,185	~103,000
OAI-PMH compliant[45]	No	Yes	Yes	Yes (via Europe PMC OAI service)	Yes	No
Open application programming (API)?[46]	No	No	Yes	Yes	No	Yes
Surfaces usage and/or download data[47]	No	No	Yes – includes altmetrics	Yes – citation data	Yes – includes altmetrics	No
Integrates with social media sharing tools	No	No	Yes	Yes	Yes	Yes
Supports ORCID IDs[48]	No	No	Yes (not mandatory)	Yes (not mandatory)	No	No

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[44] http://europepmc.org/Funders/

[45] The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a protocol developed for harvesting (or collecting) metadata descriptions of records in an archive so that services can be built using metadata from many archives. The OAI protocol is widely used by digital libraries, institutional repositories, and digital archives in order to afford their resources better visibility and access.

[46] An open API enables users to download data and (in some cases) full text from the repository for the purposes of large-scale analysis and text-mining.

[47] Surfacing usage and/or download data to end-users gives them an indication of the potential value and significance of different outputs.

[48] ORCID is a persistent digital identifier for researchers, see https://orcid.org/

Other accessibility requirements

Policy compliance is more lacklustre with regards to other aspects of accessibility. Many outputs are not stored for long-term preservation: grey literature generally is not assigned a Digital Object Identifier (DOI). DOIs are used to identify academic, professional, and government information over the lifetime of the document even if its location and other metadata may change. Referring to an online document by its DOI provides a more stable linking than simply using its URL. A number of URLs linking to reviewed outputs were broken, highlighting the danger or relying on URLs in the metadata. Discoverability is also potentially undermined when research outputs are stored on programme websites and publishing platforms with unclear metadata and indexing structures. Moreover, research outputs are rarely translated into non-English language as the policy requires. This suggests a general lack of a comprehensive approach to accessibility.

Monitoring policy compliance

The review also highlighted the lack of a clear and systematic monitoring process for the OA policy, which has been validated through our initial conversations with DFID stakeholders. Whilst there is a general agreement that the responsibility to monitor compliance rests with Senior Responsible Owners, no mechanisms are in place to assist them. Of the 10 programmes recommended by DFID, six had direct access to the list of publications produced to date, three did not provide a list of publications and one programme had to request it from the partnering funder. The publication lists did not follow a standard format and several outputs were reported incorrectly (i.e. the metadata was partial or incorrect). The absence of publication names in the Annual Reviews make it difficult to track existing publications, so the ongoing shift to ResearchFish is welcome.

We found that the vast majority of research outputs connected to a research programme were included in the lists of publications provided (see Figure 14). However, we note that this is a partial picture as no lists of publications were provided for four of the programmes considered (Clinton Health Access Initiative, GODAN, NIRP and LANSA, for a total of 133 outputs).

Fig. 14 – Listed and unlisted research outputs (n = 436)

7%

93%

■ Listed by the SRO   ■ Not listed by the SRO
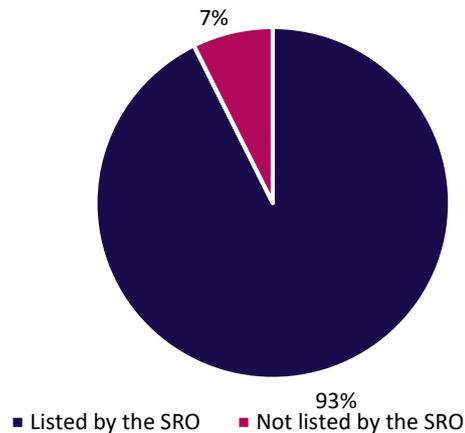
Open data

One of the key requirements of the policy is that researchers must prepare an Access and Data Management Plan at the beginning of the programme. However, we could only verify that two of the selected programmes produced an ADMP in compliance with the policy. At least two more stated that they produced a data management plan using another funder's template while several others stated that no ADMP was produced.

Very limited research data is available open access. Our review found 12 datasets, which were produced by just two programmes. Moreover, the 10 datasets published by the EOP-LIC programme appear to be available on R4D but the platform only contains a link to a written output summarising the findings.[49] The original datasets are hosted in separate repositories, such as that managed by Tilburg University, but are not easily accessible through R4D.

One of the key ways of promoting open data is by producing data availability statements (DAS). Best-practice data availability statements disclose where data supporting the results reported in a published output can be found - including, where applicable, hyperlinks to publicly archived datasets analysed or generated during the study.[50] In all cases where the data cannot be made available, a DAS should explain why that is so and under what conditions the data can be shared. There should be a clear and standalone statement if the author(s) create data, including where this can be found; or reuse data, including what was used and where it can be found.

We reviewed DAS for the 199 journal articles produced by the selected programmes, out of which 36 could not be assessed as they are not open access. Of the remaining 163 articles, 23 do not need a statement (e.g. they are literature reviews), 46 have a statement and 94 have no statement.

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[49] This is an example of what R4D classifies as 'dataset': https://www.gov.uk/dfid-research-outputs/dfid-eip-lic-innovation-capability-survey-ics-uganda

[50] See: https://www.springernature.com/gp/authors/research-data-policy/data-availability-statements/12330880

Fig. 15 – Data availability statements produced by DFID journal articles

- Not assessed (not OA)
- No availability statement
- Availability statement not required
- Have availability statement
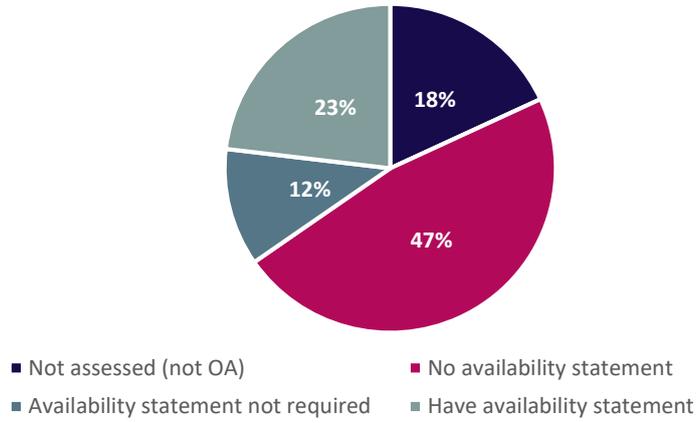
Appendix IV. Assessment of DFID's open data policy

Table 8. Assessment of DFID's policy provisions on open data against recommended practice

Area	Recommended practice	DFID policy
Policy coverage	Policies establish expectations that both stimulate and reflect changes in practice and possibilities in different fields. Where appropriate and feasible, policy coverage is extended to include the full range of data, along with software, workflows, algorithms, standard operating procedures and other materials required to validate truth claims.	**Partially met** DFID's policy is broad in scope, and applies to datasets, video, audio, images, website and software. But beyond references to raw and derived data, it provides no guidance on precisely what data (or related material such as workflows, algorithms and standard operating procedures) it covers. The references to software are unrelated to the data to which the software might relate. The policy is not linked to more recent developments such as the Inclusive Data Charter Action Plan and the requirement to "Get, Share and Use" disaggregated data to support the Sustainable Development Goals.
Data management plans (DMPs)	DMPs are required in all cases, with clear requirements on the issues to be addressed in them, domain-specific guidance on those issues, and clear assignment of individual and organisational responsibilities. DMPs are rigorously assessed and actively monitored.	**Partially met** An Access and Data Management Plan is required as part of project design, and a template is supplied as an Annex to the policy. However, the template covers all kinds of outputs from publications, to websites, and does not cover most of the issues that are now required in DMPs from a number of research funders. The policy states that RED "collects data on the extent to which researchers fulfil the requirements and recommendations of this policy". But the precise assessment and monitoring arrangements are unclear.
Data formats	Funders and other policymakers provide appropriate, discipline-specific guidance on data formats and standards, with a stated preference for open and standardised	**Not met** No guidance is provided on data formats and standards, and the policy does not state a preference for open and standardised formats.

	formats wherever possible.	
Quality assurance	Policies emphasise the need for quality standards and quality assurance, and provide or refer to guidelines on appropriate procedures to ensure that that data is accessible, understandable and usable. Strengthened but proportionate arrangements for peer review of data underlying publications are in place, underpinned by effective guidance and training for reviewers.	**Not met** No guidance is provided on quality standards or assurance.
Metadata and documentation	Discipline-specific metadata standards and documentation formats are prescribed or suggested wherever possible.	**Not met** No guidance is provided on metadata standards or documentation formats. There is no specific requirement to deposit metadata in R4D.
Preservation	Policies set clear expectations as to where, how and for how long different kinds of data should be preserved, with an appropriate balance between the value of the data, the risk of loss, and the costs involved. Disciplinary variations are respected, and it is recognised that not all data is of equivalent value.	**Met** The policy requires: • Deposit of raw or derived datasets in a suitable open access discipline or institutional repository within 12 months of final data collection • Retain and provide free on request raw datasets for a minimum of five years after project completion R4D is mentioned as a default repository when no other suitable repository is available; but it is not clear that R4D is in fact a suitable repository for data and related material. The references to deposit and retention of raw data are a potential source of confusion for researchers: is all raw data to be deposited in a suitable repository, or is at least some to be retained by the research team? The policy refers to both raw and derived data; but provides no guidance on the distinction between them. Guidance either in the policy or the implementation plan on how to find suitable repositories should be updated to include databases such as Re3Data and BioSharing; and out-of-date

		references to reports from 2007 should be removed.
Access	Policies require access to be provided via a trusted and sustainable repository, and prescribe two-way links between data and publications, in all but exceptional cases.	**Partially met** The policy requires that a statement be provided on how to access datasets; but says nothing about possible restrictions on access to data that may be sensitive on a number of grounds; or on how such restrictions might be determined
Legal and ethical issues	All policies lay explicit stress on the need for compliance with legal, ethical and regulatory frameworks, including the General Data Protection Regulation (GDPR), and provide links to relevant sources of guidance.	**Met** Exemptions are granted where doing so will lead to better development outcomes. Exemptions may also be granted on grounds of security, legal, ethical or commercial constraint.
Ownership and licensing	Policies clearly articulate (or acknowledge potential uncertainties relating to) ownership and intellectual property rights applicable to data created or collected by researchers. Appropriate licensing arrangements for different kinds of data from different sources are clearly set out. An approach of 'as open as possible, as closed as necessary' is married with robust safeguards to address the legitimate interests and concerns of research partners.	**Partially met** The policy recommends the use of the CCBY licence, and states that researchers are responsible for ensuring that they have the necessary permissions to make their material accessible. It also requires the use of open source software licences. But there is no mention of the complex IPR issues that can arise with research data and associated material such as software.
Data use	Policies set clear expectations and provide incentives for researchers to promote and facilitate re-use of their data, and provide field-specific guidance on how this can be achieved.	**Partially met** The policy sets a clear aim to increase the uptake and use of research findings; and it encourages researchers to design outputs so that they can be used 'with minimal data download'. But it provides no field-specific guidance on how this is to be achieved.