Data Management Planning

ESRC funding applicants

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University of Bristol

Research Data Service

Image: London 360 from St Paul's Cathedral, Wikimedia, Public Domain

University of BRISTOL

SUMMARY

- It is expected that Economic and Social Research Council (ESRC) funded research data will be deposited with the UK Data Service or, in the case of small datasets, with either an ESRC data service provider or a responsible repository within three months of the end of a grant.
- A Data Management Plan (DMP) is typically required at the funding application stage.
- Barriers to data sharing, along with any measures you plan to take to overcome them, should be identified in the DMP.
- For sensitive data, explicit mention of consent, anonymisation and potential access restrictions (see ESRC's *Framework for Research Ethics*[1]*)* should be made in the DMP. If the data could be highly sensitive, consider deposit with UK Data Service Secure Lab.
- ESRC expects researchers to investigate copyright and intellectual property issues and to attempt to gain copyright clearance so that data can be shared at the end of the project. Research Enterprise and Development[2] can assist with copyright issues.
- Documentation should be provided alongside the data so others can understand it. A metadata record should be created upon deposit of the data and a persistent identifier obtained so data can be formally cited.
- After funding is awarded, grant holders are required to seek further advice and guidance from the UK Data Service.

INTRODUCTION

It is a widely held view that publicly-funded research data is a public good, produced in the public interest and should, whenever possible, be openly available for secondary scientific research. This guide is for ESRC applicants, who are required to submit a Data Management Plan (DMP) along with their application.

The ESRC research data policy[3] consists of nine underlying principles which align with the UKRI Common Principles on Data Policy.[4] Like many other funding bodies, the ESRC expects grant holders, whether partially or wholly funded, to generate robust data, ready for re-use and long-term preservation.

Academic publishers also increasingly require that data which underpins a published research output (a journal article for instance) should be made available for validation purposes.

A DMP, along with any associated data management costs, is an integral part of all grant applications made to the ESRC (except for applicants applying for studentships) and must be submitted alongside your

[1] ESRC Research Ethics https://esrc.ukri.org/funding/guidance-for-applicants/research-ethics/

[2] Research Enterprise and Development, www.bristol.ac.uk/business/research-commercialisation/for-researchers/

[3] ESRC Research Data Policy. 2018, https://esrc.ukri.org/files/about-us/policies-and-standards/esrc-research-data-policy/

[4] UKRI Common Principles on Data Policy https://www.ukri.org/apply-for-funding/before-you-apply/your-responsibilities-if-you-get-funding/making-research-data-open/

main Je-S application. Your DMP should explain how you'll manage any research data that you plan to use or create. An assessment of the DMP will be made as part of the general assessment of your application. A poorly prepared DMP may have a detrimental effect on an otherwise strong application. Your DMP should include:

- Assessment of existing data - any intentions you have for re-using existing data, or justification of why new data needs to be generated
- Information on new data - the data formats you intend to use, along with a brief explanation of why you've chosen them; the volume of data you expect to create; methodologies for data collection and/or processing
- Quality assurance of data - data quality assurance procedures which will be in place
- Backup and data security - storage/security arrangements and procedures
- Expected difficulties in data sharing – any potential barriers to data sharing, along with any measures you plan to take to overcome these difficulties
- Consent, confidentiality and anonymisation - planned procedures to handle consent and anonymisation and any other appropriate ethical considerations
- Copyright and intellectual property - plans to address copyright and intellectual property ownership of the data
- Responsibilities - individuals with responsibility for implementing your DMP, and how it will be monitored and developed
- Preparation of data for sharing and archiving – plans for sharing data with the UKDS; how data will be organised; documentation and metadata, including relevant standards

The UK Data Service provide guidance for ESRC grant applicants on writing a DMP[5], and the criteria by which reviewers should assess DMPs is also available.[6]

Assessment of existing data

When assessing your grant application, ESRC reviewers will be looking for evidence that you have considered and evaluated secondary sources of data before considering primary research. The ESRC evaluate equally all applications for funding on the basis of scientific quality, regardless of whether the research intends to re-use existing data or to create new data. If you are planning to create new data, then you should include in your DMP an analysis of the gaps identified between available and required data to show why new data is necessary.

Information on new data

Use this section to describe any new data that will be created, and how it will be collected. As part of your DMP you should state in which format(s) your data will be collected, analysed and stored (for example, Open Document Format, .CSV file or Excel spreadsheet). Your own research needs must come first in selecting a

[5] Data management planning for ESRC researchers https://www.ukdataservice.ac.uk/manage-data/plan/dmp-esrc

[6] Data management plan: guidance for peer reviewers https://esrc.ukri.org/files/funding/guidance-for-peer-reviewers/data-management-plan-guidance-for-peer-reviewers/

data format. If you find that you do need to use a non-standard format, you should consider converting your data to a more widely re-usable format once your own data analysis is complete. For example, if you intend to use analysis software such as NVivo, you should mention in your DMP that your data will be exported at the end of the project in the widely accepted forms of text files, spreadsheets and XML. If you're unsure which file formats to use, the UK Data Archive publishes a list of recommended deposit formats.[7] These formats may also be appropriate for use throughout your research.

A major barrier to data sharing is the widespread use of non-standard, highly specialised or 'proprietary' file formats, which require a number of technological dependencies in order for a file to be used. Where dependencies are inevitable you should favour 'open' technologies rather than proprietary ones. Proprietary technologies are owned by a vendor or group of vendors. Commercial pressures may lead to the withdrawal of a particular piece of commercial hardware or software, in favour of a new and possibly incompatible replacement. In contrast, 'open' technologies are supported by a community of users and do not have the same commercial vulnerabilities.

It is also useful in your DMP to try and estimate the size of the data you expect to generate. This can be difficult to do before a study begins; if necessary, use quantities generated in a similar previous study as the basis for your estimate.

Quality assurance of data

Your Case for Support should describe the actions you plan to take to ensure the quality of your proposed research activities as a whole. The DMP is only concerned with the quality of your research data. Quality should be considered whenever data is created or altered, for instance at the time of data collection, data entry or digitisation. You should provide information about the procedures you will carry out to ensure that data quality is maintained, such as allocating time to validate data or entering values into prepared databases or transcription templates. Interview software can also help by verifying consistency and detecting inadmissible responses.

Backup and data security

Use this section to describe how your data will be stored and backed up throughout the duration of the project. It is recommended that, as you generate or gather data, you store it in the University's Research Data Storage Facility (RDSF), managed by the Advanced Computing Research Centre (ACRC).[8] Each research staff member is entitled to 5TB of storage without charge. If your storage quota is used up, or your project requires more storage space, there will be a cost and ACRC should be contacted for guidance before your application is finalised. The back-up procedures, policies and controlled access arrangements used by the RDSF are of a very high standard. If you do not intend to make use of the RDSF, your storage provider's back-up procedures should be described instead. If you will be working

[7] UK Data Service Recommended Formats Table, www.ukdataservice.ac.uk/manage-data/format/recommended-formats

[8] Advanced Computing Research Centre, https://www.acrc.bris.ac.uk/

collaboratively with other institutions, make sure that the security and back-up procedures of each data holding partner are described within the DMP.

Your DMP should also describe how you'll keep your data safe before it is deposited with a storage facility such as the RDSF. This is particularly important if you're conducting field research. As a minimum requirement, try to ensure at all times at least two copies of the data exist and that every copy can easily be accounted for and located if required.

ESRC grant holders must adhere to the requirements of the Data Protection Act 2018 and the General Data Protection Regulation (GDPR). If you plan to handle sensitive, personal data, extra security measures must be considered. The Office of the University Secretary[9] can provide more advice on observing Data Protection legislation.

Expected difficulties in data sharing

Whilst the re-use of data is very much encouraged, it is recognised that some research data will be sensitive and unsuitable for sharing. It is the responsibility of the researcher to consider confidentiality, ethics, security and copyright before beginning any ESRC-funded research. It may be that parts of the data that are sensitive cannot be shared, but the remainder can. You should read the ESRC's *Framework for Research Ethics,*[10] and anticipate and address any likely barriers to data sharing. More guidance is available from our document Sharing Research Data Concerning Human Participants.[11]

If you believe that your research data cannot be shared at all, you must provide justification for this. Waivers of deposit to ESRC data services are exceptional, and the ESRC reserves the right to refuse waivers if there is insufficient evidence that the applicant has fully explored all strategies to enable data sharing. In particular, the ESRC requires researchers to demonstrate due diligence in three areas before it will consider a waiver:

- when gaining informed consent, include consent for data sharing (see below)
- where needed, protecting participants' identities by anonymising data
- considering data access restrictions in the DMP

In addition to the UK Data Service,[12] the Secure Lab[13] has been established to promote excellence in research by enabling controlled access to data deemed too sensitive or confidential to be made openly available. If you think your data will be suited for deposit with the UK Data Service Secure Lab, you should contact them directly for confirmation before finalising your DMP.

Consent, confidentiality and anonymisation

Including the correct information in consent forms is crucial for the potential sharing of data. Obtaining

[9] Office of the University Secretary, https://www.bristol.ac.uk/secretary/data-protection//
[10] ESRC Framework for Research Ethics. 2015, https://esrc.ukri.org/files/funding/guidance-for-applicants/esrc-framework-for-research-ethics-2015/

[11] Sharing research data concerning human participants, http://bit.ly/35hldfU
[12] UK Data Service, http://ukdataservice.ac.uk/
[13] UK Data Service Secure Lab, http://ukdataservice.ac.uk/get-data/how-to-access/accesssecurelab.aspx

permission to publish data from human research participants is essential even if data is to be anonymised before publication. This is because some risk of re-identification may remain, even after anonymisation, and participants should be made aware that others outside of the research project may be able to view this data. Also, even if a participant has the right to withdraw from a study, it may not be possible to remove their data: the ESRC Framework for Research Ethics states that all research should indicate the point at which data will have been anonymised and amalgamated and in certain circumstances cannot then be excluded. If you will be gaining consent from participants for your research you should read the ESRC Framework for Research Ethics, which contains guidelines on consent for publishing data. The Research Data Service has also produced a guide to sharing research data involving human participants, which includes sample statements for consent forms.

Use your DMP to explain any anonymisation procedures that will take place prior to data being archived or shared. The exact information that needs to be removed during the process of anonymisation will vary depending on the contents of the dataset and the reason the unmodified data has been deemed unsuitable for sharing. The UK Data Service provide more guidance on effective anonymisation.[14]

Copyright and Intellectual Property

If you are planning to use existing data as part of your research, the data may be subject to copyright or other restrictions which could prevent you from sharing any new data you derive from it. The ESRC will expect applicants to investigate these issues and to attempt to gain copyright clearance so that your data can be shared at the end of your project. You should give full and appropriate acknowledgement, via citation, for any existing data that you use.

Unless stated otherwise, the ownership of intellectual property lies with the organisation carrying out the research. If you plan to work collaboratively with an external partner, copyright and IPR issues should be clarified in a Consortium Agreement. This isn't required as part of your application, but it should be mentioned that if the application is successful such an agreement will be created. All partners should be aware before applying for funding that a Consortium Agreement will be forthcoming. Research Enterprise and Development[15] prepare Consortium Agreements and can advise on other IPR issues.

Responsibilities

Data management responsibilities should be clearly assigned to named individuals in your DMP. In collaborative research projects, several individuals from different institutions can be named if appropriate. Plans described here should tally with the 'Staff Duties' and 'Justification of Resources' sections in the main Je-S application form. Several supporting services are in place at Bristol to help you manage your research data, and any of these which you plan to use should be mentioned in your DMP.

[14] UK Data Service Anonymisation https://www.ukdataservice.ac.uk/manage-data/legal-ethical/anonymisation

[15] Research Enterprise and Development, http://www.bristol.ac.uk/red/contracts/

These services include: ACRC (data storage), your Zonal IT team (everyday IT support), the data.bris service (research data management training and general data management guidance), RED (Consortium Agreements for collaborative research and IPR) and the Office of the Secretary (for Data Protection and FOI).

Preparation of data for sharing and archiving

At the close of a funded project, the ESRC data policy stipulates that your research data must be formally deposited with the UK Data Service within three months of the end of the grant. The ESRC will withhold final grant payments as a penalty for not doing so.

Smaller datasets (for example a subset of data which supports claims made in a journal article) may be lodged with an ESRC data service provider, or an appropriate responsible digital repository such as the University of Bristol Research Data Repository.[16] If using a non-ESRC data service provider, it is the grant holder's responsibility to ensure a persistent identifier (such as a DOI) is provided for the data and to inform the UK Data Service of the published location. A project metadata record should also be created in the UK Data Service's ReShare repository to maximise the discoverability of the data. There are many benefits to depositing research data with one of the ESRC data services, including active promotion of your research and services available for dealing with sensitive data.

You must provide a statement on data sharing in the relevant section of the Je-S application form. Your DMP should indicate exactly how this sharing will be achieved. Describe your plans to deposit your data with an ESRC data service or any other repository or give reasons why this is not possible. The ESRC will allow an embargo period on data (generally no longer than 12 months from the end of a grant) to allow grant holders to publish their research findings. If you plan to use an embargo period state this in your DMP.

It is important to provide information on how your data will be documented throughout the project and the metadata that will be provided upon deposit with the UKDS or an equivalent repository. Metadata is 'data about data' and is information (or cataloguing information) that enables data users to find and or use a dataset. In your DMP you should outline plans for documenting your research data, to meet both your own needs and those of later users.

The ESRC expects documentation to include information such as data origin, fieldwork and collection methods, and any processing of the data. Descriptions of your data could be kept in a separate, dedicated database or in a spreadsheet. If you're planning to use data analysis software, such as a qualitative analysis package, you will also have the option of adding documentation within the software itself in the form of notes, memos, nodes or classifications.

When your data is deposited with an ESRC data service provider or responsible repository, you will be expected to complete a standardised metadata record. In some cases you will be expected to use metadata standards, such as the Data Documentation Initiative

[16] University of Bristol Research Data Repository http://data.bris.ac.uk/data/

(DDI) specifically developed for the social sciences[17]. Whilst the ESRC allow a period of privileged use for collected data, they still expect a metadata record to be published at the earliest opportunity, including details of how and when the data can be accessed.

You should also outline within your DMP how you'll name files and folders to make sure that you and others have appropriate access. You should describe how you will keep track of different versions of documents (for instance, by adding version information to the first page of each Word document and by setting a folder aside for definitive, 'milestone' versions of documents).

In attempting to organise and document your data, it may help to imagine a secondary data user trying to make sense of your data in your absence, after your project has concluded. If presented with only the data itself, this secondary user may be faced with the difficult task of 'unpicking' it. How will they make sense of your file and folder naming conventions? What extra information would they need to make maximum use of your data?

DMP development

Once funding has been awarded, grant holders are expected to implement their DMP from the first planning stages of the project, as well as seeking advice and guidance from the UK Data Service to clarify how plans to deal with confidentiality and data sharing are to be implemented in practice. In addition to this, where relevant, the grant holder is expected to report on the ongoing implementation of the DMP to ESRC. Any issues arising during ESRC-funded research that could impact on data sharing must be raised with your assigned ESRC case officer as soon as possible.

CITING RESEARCH DATA IN RESEARCH OUTPUTS

From 1st April 2013 all the UK's Research Funding Councils, as part of RCUK (now UKRI), require research outputs (i.e. journal articles) to provide a means by which third parties can access any underpinning research datasets. The ESRC expects all grant holders to deposit data at the same time as outputs (e.g. journal articles) are published, and to use repositories which provide persistent identifiers for datasets (such as a DOI) which can be formally cited. A Digital Object Identifier or DOI printed in a paper will lead an enquirer to a specific webpage where either the data is directly available, or that contains details of how the data can be accessed.

Given the extended timescales involved in the publication process, it is strongly recommended that the authors of published academic outputs *do not provide their current contact details* as a means by which underpinning research data may be accessed, as these will change over time.

[17] DDI Data Documentation Initiative. 2014, http://www.dcc.ac.uk/resources/metadata-standards/ddi-data-documentation-initiative/

SAMPLE ESRC DATA MANAGEMENT PLAN

INTRODUCTION

The following is intended as an illustration of an ESRC Data Management Plan. It is drawn from a real world ESRC proposal "The diversity effect: intergroup interactions and the impact of diversity on young people's attitudes and academics" prepared by Dr Shelley McKeown Jones of the University of Bristol's School of Education. The plan is made public with the kind permission of the applicant.

Further costing and ethical issues relating to the proposal were covered in the wider 'Case for Support'. This document is not available; however, the following statement explains the nature of the planned digital outputs and how they relate to the wider research questions:

"Methodologically, the project will provide two main innovations. First, it will integrate multiple quantitative and qualitative methods and techniques longitudinally, moving beyond mere self-report of attitudes which is currently a focus in UK social science research on diversity, and in doing so provide a new, multilevel dataset for further research. This will include observations of seating behaviour in different spaces within the target schools, social network analysis and advanced statistical analysis of longitudinal questionnaire responses. Second, it will move beyond observations of the effects and develop a short and easy to implement intervention which will have potential to be scaled up and used across the UK and beyond. To achieve this, the project will work with teachers and other stakeholders in the design, execution, and dissemination of the research at different stages throughout and after the project."

SAMPLE DATA MANAGEMENT PLAN

This data management plan was devised in line with the ESRC Research Data Policy, the UKDS data management guidance and the UK Data Archive's Managing and Sharing Data guide.

Assessment of existing data

Due to the novelty of the topic, which combines social and educational outcomes in addition to observable behaviours longitudinally, there are no existing datasets that this research could draw from. Whilst there are cross-sectional surveys which have examined youth attitudes, such as the young people's social attitudes survey, these do not cover intergroup contact experiences, nor do they assess intergroup attitudes or educational outcomes over time or how these are linked to behavioural patterns. This has been confirmed by searching the online catalogue of the Economic

and Social Data Service (http://www.esds.ac.uk/Lucene/Search.aspx). Using the key words "youth" and "attitudes" and "education", no entries relevant to this project are found. The proposed research is therefore innovative and will be a significant contribution to the scholarship on diversity and social/educational outcomes in the UK and beyond.

The development of new data

The new data which will be generated by this research is described as follows:

(1) Observations of pupil seating choice in the classroom and cafeteria will be recorded using Microsoft Word on computer tablets (purchased for this purpose). The researchers will code whether the person sitting in each seat is Black (coded B), Asian (coded A) or White (coded W) and whether they are male (coded M) or female (coded F) at various time points. No other information will be coded and schools will not be identifiable from these maps as numbers will be used instead of names (e.g. School 1, 2, 3). All maps will be stored under the password protect format in Microsoft Word and within 24 hours of data collected will be transferred (and deleted) from the tablets used for data collection to the PI's university Research Data Storage Facility (RDSF – see below) account. Map analysis will be performed using an Excel spreadsheet, stored under password protect on the RDSF.

(2) Paper based questionnaires will be distributed to pupils at each of the time points in Phases 1,2 and 3 (see **case for support**). Immediately upon completion questionnaires will be collected and stored in a locked ballot box. On return to the University, questionnaires will be stored in a locked filing cabinet in the PI's locked office. Questionnaires will be removed only when the RA requires them for data input. All information gathered from the questionnaires will be manually coded into SPSS by the RA. The SPSS data file will be stored under password protect and backed up on the RDSF. The questionnaires will not include any personal information which can be used to identify participants, all participants will be identifiable only through an allocated participation code which can be used should participants wish to remove their data at a later stage (up to the point of depositing into the UKDA).

(3) Workshops held with teachers in each of the target schools (to inform the intervention) will be digitally audio recorded on a voice recorder and later transcribed into Word documents by the RA. Until transcription is complete, the audio files will be transferred from the voice recorder to PI's university RDSF account and stored under password protection. Stakeholder meetings will also be recorded and summarised in a Word document for circulation to members. Once transcription has been completed, the voice recordings will be deleted in order to avoid voice recognition of subjects, meaning that oral recordings will not form part of the dataset.

(4) Field notes of participant observations and conversations will be collected using typed notes in Microsoft Word on the tablets. These will be removed from the tablets and secured in password protect word documents on the PI's RDSF account within 24 hours of the observations.

(5) Intervention materials developed as a result of the teacher focus groups and Phase 2 data, will be typed up in Microsoft Word and stored under password protection. These materials will be shared with the Stakeholder group and with teachers but only in hard copy in order to further refine them. At the end of the project, the finalised materials will be shared in electronic form on the project website and published as a dataset with a DOI.

Responsibilities and Quality Assurance of Data

The PI will have overall responsibility for implementation of the data management plan. The PI and RA will use the data management checklist on a weekly basis. Quality assurance will be maintained through a number of avenues. First, the PI will train the RA in methods of data collection to ensure consistency. As only the PI and RA will be involved in data collection, this will help ensure standardised data collection, organisation, management, security, and storage. The PI and RA will meet regularly to ensure these checks and consistencies are maintained throughout the project. Second, the PI and RA will cross check data input, analysis and interpretation. This will ensure reliability of the data collected. Third, the PI will ensure that ethical approval is obtained from the Faculty of Social Sciences and Law Research Ethics Committee and that informed consent is obtained from participants prior to data collection. Participant information sheets will include telling participants that their data will be deposited into the UKDA.

Backup and Security of Data

Completed questionnaires and handwritten field-notes will be stored in locked filing cabinets in the PI's office and destroyed at the end of the project. Audio recordings will be destroyed once transcribed. Typed data will be stored on the PI and RA's university desktops and on tablets (during data collection). During the project, data will be stored on the University's Research Data Storage Facility (RDSF) secure network and backed up on a daily basis. All materials collected on the tablet will be transferred to the RDSF on a daily basis. No sensitive information will be kept in this folder and all research output will be based on unique numbers assigned to each participant. Participant consent forms will be stored in a locked filing cabinet and destroyed at the end of the project. Digital recordings of workshops and stakeholder meetings will be deleted from the recorders following transcription. The University's RDSF, provides an integrated highly resilient petascale facility to researchers from all disciplines for long-term, secure storage of research data. Currently, each data steward is allocated 5TB of space, free of charge, which will be sufficient for the research output from this project. RDSF data can be accessed through the PI's university computer. The data is transmitted via CIFS (Common Internet File System) which Windows users use to transfer data between the desktop and the RDSF. Data exported to Windows desktops has two levels of access control based on source network and

authentication against the University of Bristol (UoB) Active Directory. Data is backed-up on the University network drive and the RDSF every day. The PI can limit the people who can access the data stored in the RDSF, by telling the RDSF administrators when they apply who they wish to access the data and providing relevant IP addresses, this will be limited to the PI and RA desktops.

Expected difficulties in data sharing

Data sharing will be considered integral to the project and has been implemented into the research design. To ensure academic integrity, the research will comply with the 1998 Data Protection Act. Ethical approval will be sought from the Faculty of Social Sciences and Law Research and Ethics Committee at the University of Bristol, which in turn reports to the University of Bristol Research Ethics committee (see Ethical Information). For all participants, informed written consent will be obtained after informing them of how the data will be collected, stored, and analysed as well as about the long-term plans for the data, such as data archiving after anonymisation. Based on ethical implications, only certain information obtained will be shared with the UK Data Archive (see preparation for data sharing and archiving below). Identifying information will not be shared, such as the observational maps or details surrounding the schools involved to ensure schools are not identified from the data.

Copyright and Intellectual Property Right

All data and outputs produced from the research, including the intervention materials will remain property of the University of Bristol and the responsibility of the PI.

Preparation of data for sharing and archiving

Relevant sections of the data will be made available for sharing via the UKDA, subject to consent from participants, and after ensuring that measures to protect the privacy, confidentiality, and anonymity of research participants are firmly in place. The Planning and Sharing Tool and the Data Management Checklist will be utilised to guide the preparation and documentation of data for archival purposes. The following will be archived:

(1) At the end of the project an Excel spreadsheet will be created containing metadata to catalogue information to enable other users to understand and access the data. Information will include a guide of what data exists and how it has been catalogued and classified, as well as details on research methods, the analysis process, context, copyright and intellectual property ownership, an explanation of acronyms, and information on data access controls and ethical sensitivities.

(2) The SPSS data files from questionnaires will be deposited as .por files as these files are more stable and are transferable across statistical packages. These will be accompanied by documentation such as the syntax, interview schedule, sampling methodology, and consent form template in PDF file format. The excel data sheet

(recording behavioural observations) will be shared as a .CSV file but will only detail the observation dates/times and the racial composition of the space, including the statistical calculations obtained.

(3) Due to the potential for participants to be identified, the digital recordings of stakeholder meetings and teacher interviews will not be deposited in the UK Data Archive. Instead, the materials developed as a result of the teacher discussion will be published as datasets with a DOI which will be linked to the project website,

All articles, reports and publications will state clearly that data are available for use by others (including citation of the DOI), which will generate further interest in it.

Costing data management

The costs of data collection (including equipment costs), analysis and sharing have all been accounted for in the Justification of Resources attachment. As for the costs of storage, RDSF provides up to 5TB of disk storage per data steward free of charge. Data collected during the course of the project will not exceed the 5TB limit. The costs of data archiving are included in project costs, and were made using the UKDA Data Management Costing Tool.