Data Management Planning

ESRC FUNDING APPLICANTS

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Document History

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1-3	02.09.2015	A. Burnham	Inclusion of RDM Principles, updates and corrections, new data policy 2015
1-2	27.03.2014	A. Burnham	Minor edit.
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First published version (1-0) \UoL_DMP_ESRCGuide_v1-0.docx	08.07.2013	A. Burnham	First published version.
Draft 4 \UoL_DMP_ESRCGuide_v0-4.docx	08.07.2013	A. Burnham	Final draft with minor edits.
Draft 3 \UoL_DMP_ESRCGuide_v0-3.docx	06.06.2013	A. Burnham	Third draft from review by RCMG. Approved for release by PVC Research
Draft 2 \UoL_DMP_ESRCGuide_v0-2.docx	28.05.2013	A. Burnham	Second draft for review by RCMG.
Draft 1 \UoL_DMP_ESRCGuide_v0-1.docx	16.04.2013	A. Burnham/University of Bristol	First draft using University of Bristol document as basis.

The mission of the ESRC is to promote and support, by any means, high-quality basic, strategic and applied research and related postgraduate training in the social sciences

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.

The ESRC Research Data Policy (2015)[1] consists of nine underlying principles which align with the RCUK Common Principles on Data Sharing[2]. 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.

This guide is intended for Economic and Social Research Council (ESRC) applicants who are required to submit a Data Management Plan (DMP) along with their application.

1. Summary of ESRC data requirements

The following points summarise ESRC data requirements:

- All data created or repurposed during the lifetime of an ESRC grant must be made available for re-use or archiving within three months of the end of the grant, with formal deposit with a responsible data repository.

- The key change in the 2015 data policy is that "*ESRC grant holders are no longer automatically required to offer data to the UK Data Service*" – it is acceptable to deposit with "*an appropriate responsible digital repository*".

- It is the grant holder's responsibility to incorporate data management as an integral part of the research project, in the belief that a structured approach to data management results in better quality data that is ready to deposit for further sharing.

- ESRC recognise that some research data are more sensitive than others, and believe that it is the responsibility of the grant holder to consider all issues related to confidentiality, ethics, security and copyright before initiating the research.

- The grant holder's institution is expected to provide guidance and advice to ESRC grant holders on implementing data management and sharing plans, and ensure ESRC grant holders comply fully with the research data policy.

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[1] ESRC research data policy, http://www.esrc.ac.uk/about-esrc/information/data-policy.aspx
[2] RCUK Common Principles on Data Sharing, http://www.rcuk.ac.uk/research/datapolicy/

2. What you need to do – key data requirements

The ESRC state that data are the main assets of economic and social research. They are the basis for research and also the ultimate product of research. The ESRC, like many other funding bodies, 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 Data Management Plan (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 should be submitted alongside your 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 describe:

- Any intentions you have for re-using existing data.
- How data will be shared and potential barriers to data sharing, along with any measures you plan to take to overcome these difficulties.
- Consent, confidentiality, anonymisation and any other appropriate ethical considerations.
- 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.
- Data quality assurance procedures.
- Plans to address copyright and intellectual property ownership of the data.
- Back-up and security arrangements.
- How your DMP will be implemented, monitored and developed.
- Individuals with responsibility for implementing your DMP.

The Digital Curation Centre (DCC) provide a web-based data management plan creation tool, 'DMP Online'[3] which includes, amongst others, an ESRC template (based on the requirements laid out by the ESRC in their Research Data Policy and Research Funding Guide[4]). Through piloting at the University it has been found that creating a DMP through this tool may prove beneficial, particularly if one-to-one assistance is given e.g. in order to discuss the meaning and purpose of data and data management questions.

The ESRC Data Policy Principles are shown below at 16.

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[3] DMP Online, https://dmponline.dcc.ac.uk/
[4] EPSRC Research Funding Guide, http://www.esrc.ac.uk/funding-and-guidance/guidance/applicants/research-funding-guide.aspx

3. Where to get help and information

Refer to the University research data website www.le.ac.uk/researchdata where specific funder related information and the latest data management advice will be included.

The range of appropriate contacts includes:

- IT Services
- Library
- Research Support Office
- Leicester Learning Institute
- Information Assurance Services
- Enterprise and Business Development

A single point of contact is also available: email researchdata@le.ac.uk at any time and as early as possible in the bid process. This will means specific queries or general request for assistance can be directed to the right place(s). You can also request assistance with development of a data management plan via this email address.

It is also recommended that you use the Digital Curation Centre (DCC) DMPOnline[5] resource to create a data management plan (DMP) using the BBSRC template and requirements. As and when University of Leicester templates and specific guidance are created this will be confirmed on the RDM website[6].

Specific research IT services available include Research File Storage, high performance computing, Wiki, 'LAMP' stack (a general purpose, Linux, relational database and web hosting service, based around open source software- Linux, Apache, MySQL and PHP), file transfer (FileDrop) and source code control (Subversion SVN)[7].

In 2014 the University agreed it's **RDM Principles**[8] which act to guide researchers and inform funders of the University approach (see 15. below).

ESRC and general Information

ESRC Research Data Policy (2015)	http://www.esrc.ac.uk/about-esrc/information/data-policy.aspx http://www.esrc.ac.uk/_images/research-data-policy_tcm8-34123.pdf
ESRC Research Data Policy - FAQs	http://www.esrc.ac.uk/_images/research-data-policy-faqs_tcm8-34563.pdf
ESRC Research Funding Guide (2015)	http://www.esrc.ac.uk/_images/Research-Funding-Guide_tcm8-2323.pdf
ESRC Framework for Research Ethics (2015)	http://www.esrc.ac.uk/_images/framework-for-research-ethics_tcm8-33470.pdf

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[5] DMPOnline, https://dmponline.dcc.ac.uk/
[6] Data Management Planning, http://www2.le.ac.uk/services/research-data/create-data/DMPlan
[7] IT Services, http://www2.le.ac.uk/offices/ithelp/
[8] RDM Principles, http://www2.le.ac.uk/services/research-data/documents/uol_rdmprinciples

ESRC Postgraduate Funding Guide	http://www.esrc.ac.uk/funding-and-guidance/postgraduates/esrc-students/index.aspx
ESRC Open Access to research outputs – ESRC's policy and your obligations	http://www.esrc.ac.uk/funding-and-guidance/guidance/grant-holders/open-access.aspx
ESRC Data Management Plan – guidance for peer reviewers	http://www.esrc.ac.uk/_images/Data-Management-Plan-Guidance-for-peer-reviewers_tcm8-15569.pdf
UK Data Service (Economic and Social Data Service)	http://ukdataservice.ac.uk/
UK Data Archive – Managing and Sharing Data	http://www.data-archive.ac.uk/media/2894/managingsharing.pdf
Jisc Digital Media	http://www.jiscdigitalmedia.ac.uk/ http://www.jiscdigitalmedia.ac.uk/guides/a-z
Digital Curation Centre ESRC Funder's Data resource	http://www.dcc.ac.uk/resources/policy-and-legal/research-funding-policies/esrc
Digital Curation Centre 'DMP Online' tool	https://dmponline.dcc.ac.uk/
Digital Curation Centre DMP Checklist	http://www.dcc.ac.uk/resources/data-management-plans/checklist
University Research Data Management website	www.le.ac.uk/researchdata
University Research Data Management Support	researchdata@le.ac.uk
RCUK Joint Electronic Submission System (Je-S)	https://je-s.rcuk.ac.uk/JeS2WebLoginSite/Login.aspx

4. Re-use 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 explain in your DMP why this is necessary.

5. Data sharing

At the close of a funded project the ESRC stipulates that your research data **must be made available for re-use or archiving with one of the UK Data Service or another "*appropriate responsible digital repository*" within three months of the end of the grant**. The ESRC will withhold final grant payments as a penalty for not doing so. If it is accepted for deposit, the grant holder is expected to make data available to the data service without delay. There are many benefits to

depositing research data with one of the ESRC data services, including the active promotion of your research.

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.

While 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[9], and anticipate and address any likely barriers to data sharing. Where ethical issues arise, consult within your College and refer to the research data management website and University policy[10].

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:

- gaining informed consent, include consent for data sharing
- protecting participants' identities by anonymising data
- considering data access restrictions

In addition to the UK Data Service[11], an UKDS Secure LAB[12] has been established to promote excellence in research by enabling controlled access to data deemed too sensitive or confidential to be made openly available.

6. Data formats

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 spread sheet). Your own research needs must come first in selecting a 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, spread sheets and XML. If you're unsure which file formats to use, the

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[9] ESRC Framework for Research Ethics, 2015, http://www.esrc.ac.uk/_images/framework-for-research-ethics_tcm8-33470.pdf

[10] Research Data Management website and University ethics policy, http://www2.le.ac.uk/services/research-data/create-data/dp-ethics

[11] UK Data Service, http://ukdataservice.ac.uk/

[12] UK Data Service Secure Lab, http://ukdataservice.ac.uk/get-data/how-to-access/accesssecurelab

UK Data Archive publishes a list of recommended deposit formats[13]. Refer also to Jisc Digital Media[14]. These formats may also be appropriate for use throughout your research.

7. Open and proprietary technologies

A major barrier to data sharing is the widespread use of non-standard, highly specialised file formats. In order to use any digital file, a number of digital technologies must be available, which are known as technological 'dependencies'. These may be fairly common technologies such as a desktop PC, the Windows 7 operating system and Adobe Reader software, or the technology required to access data might be rare and hard to acquire or even unique. You should address this problem by minimising the number of technological dependencies involved in using your data.

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.

8. Ensuring the quality 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.

9. Copyright

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

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[13] UK Data Archive File Formats Table, www.data-archive.ac.uk/create-manage/format/formats-table
[14] Jisc Digital Media, http://www.jiscdigitalmedia.ac.uk/

forthcoming. University Enterprise and Business Development[15] prepare Consortium Agreements and can advise on other IPR issues.

10. Backup and data security

It is recommended that, as you create data, you should store it in the University's Research File Storage facility (RFS), managed by IT Services. All those with research storage needs are able to register for this service in order to be allocated a storage allocation appropriate to the project[16]. Researchers are not charged for this service (unless requirements are extremely large), it offers peace of mind (for the researcher and research funder) and reduces researcher IT responsibilities, being managed by IT Services as a secure service, backed-up daily. The back-up procedures, policies and controlled access arrangements used by the RFS are of a high standard and a description of them can be provided for your application. If you do not intend to make use of RFS, your data storage provider's back-up procedures should be described instead. If you will be working 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 briefly describe how you'll keep your data safe *before* it's deposited in a secure storage facility (such as RFS). This is particularly important if you're conducting field research. As a minimum, try to ensure that at all times more than one copy of the data exists, and that every copy can easily be accounted for and located, if required. Mobile devices (laptops, external drives, voice recorders etc.) should be encrypted and put in place appropriate data transfer processes from these to secure storage.

ESRC grant holders must adhere to the requirements of the Data Protection Act 1998. If you plan to handle sensitive, personal data, extra security measures must be considered. Information Assurance Services [17] can provide more advice on observing Data Protection legislation.

11. Organising and describing data

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.

Descriptions of your data could be kept in a separate, dedicated database or in a spread sheet. 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.

You should also outline within your DMP how you'll logically structure data, name files and folders to make sure that you and others have appropriate access[18]. You should also describe how you will

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[15] University Enterprise and Business Development, http://www2.le.ac.uk/offices/ebd
[16] Research File Storage, http://www2.le.ac.uk/offices/ithelp/services/rfs
[17] Information Assurance Services, http://www2.le.ac.uk/offices/ias
[18] Research Data Management website, http://www2.le.ac.uk/services/research-data/organise-data/organise

keep track of different versions of documents, for instance, by adding a version control table within a Word document and by setting a folder aside for definitive, 'milestone' versions of documents[19].

In attempting to organise and document your data, it may help to imagine another 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 other 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?

12. DMP development

Once funding has been awarded, grant holders are required to seek advice and guidance from the ESDS to clarify how plans to deal with confidentiality and data sharing are to be implemented in practice. In addition to this, the grant holder is expected to report annually on the on-going implementation of the DMP. 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.

13. Roles and 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 Leicester to help you manage your research data, and any of these which you plan to use should be mentioned in your DMP (see 3. Where to get help and information).

14. Citing research data in research outputs

All journal articles and conference proceedings submitted for publication after 1 April 2013 which are the result of RCUK funded research must be made available for anyone to read without charge (made available on 'open access'). Open access means that anyone with an internet connection can read your research paper or conference proceeding without the frustration of hitting a subscription or publisher paywall. The benefits in terms of wider dissemination, greater openness and transparency, and speeding up of discovery are considerable.

This requirement includes providing a means by which third parties can access any underpinning research datasets. This may be a reference (such as a unique URL or DOI) printed in a paper, which will lead an enquirer to a specific web page where the data is available. The enquirer might be directed to a page which displays the contact details of a custodian of the data, whom they are asked to email in order to gain access to the data.

Given the extended timescales involved in this process, it is strongly recommended that the authors of published academic outputs *do not provide their current contact details* as a means of accessing underpinning research data, as these details will change over time. If you plan to use an established

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[19] Research Data Management website, http://www2.le.ac.uk/services/research-data/organise-data/version-control

data repository service, ask this service for a unique reference identifier which could be included in the publication instead. If you're not planning to use an established data repository service, contact researchdata@le.ac.uk or the Library for further guidance.

15. University RDM Principles

In 2014 the University agreed its **RDM Principles**[20] which act to guide researchers and inform funders of the University approach and should be referred to in funding proposals.

> *Research data are defined as any material created or collected for the purposes of analysis to generate and validate original research results, irrespective of the format of data. Research data may be digital, paper based or in other forms. Examples of different types of research data include datasets, images, text (such as transcripts of interviews), audio and video recordings, and computer scripts.*

Scope

1. *These principles apply to all research conducted at the University, regardless of funding source. They do not imply additional compliance where good practice and relevant research funders' requirements are already being followed.*

Research inception and planning

2. *Data management planning is an integral, essential and dynamic component of the research process from inception and should include provision for the selective long term custodianship of research data.*

3. *Research proposals should include all possible recovery of direct costs of research data management where the funder allows this.*

During the research: management and storage of data

4. *During the research process, data are an asset which needs to be appropriately managed and stored: to meet legislative, funder, information governance and University requirements; to facilitate data security (confidentiality, integrity, availability); to facilitate appropriate access, collaboration and sharing of data and results.*

5. *Data can be actively managed throughout, following and updating the data plan, recognising that storage and its funding is not infinite, with ongoing decisions*

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[20] RDM Principles, http://www2.le.ac.uk/services/research-data/documents/uol_rdmprinciples

regarding retention and destruction.

After the research: retention, sharing, publishing, citation, re-use

6. *When the research has been completed, research data (including websites) of long term value, or data required by funders or the University must be selected for retention, then preserved and curated for as long as appropriate.*

7. *Data retained in these circumstances must be offered to funder or discipline repositories and/or to the UK Web Archive as appropriate. If such repositories are unavailable or unsuitable, data must be stored in a University repository. Data deposited with external repositories or unsuitable for making open access must be registered with the University.*

8. *There is a presumption of open access to data held in a University or other public repository. However, access may be restricted, subject to a time embargo or not permitted for legal (i.e. intellectual property, data protection, confidentiality, contractual requirements), ethical or commercial reasons.*

9. *Data should not be deposited with any organisation that does not commit to appropriate access and availability for re-use and exclusive rights to re-use or publish research should not be handed to commercial publishers, unless this is a condition of funding.*

10. *The re-use or sharing of data that are made available should not be unnecessarily restricted by licences or terms of use.*

11. *All research outputs must cite data produced and/or used during research as appropriate, detailing access to that data.*

Responsibilities

12. *Primary accountability for research data management lies with the most senior University researcher associated with the work or project. Responsibility for research data management may be delegated.*

13. *During the research process, researchers are responsible for adherence to legal requirements such as Data Protection and for the creation of metadata and other documentation that enables data to be discoverable, understandable and re-useable.*

14. *After the deposit of data with a repository, the repository is responsible for the on-going management of that data in accordance with legal, technical and other requirements.*

15. *The University will be responsible for providing a Research Data Management service led by the Library to include training, advice, guidance and data curation.*

16. *The University will secure sustainable solutions that meet the requirements for long term data storage and re-use as set out in these principles.*

16. The ESRC Research Data Policy Principles

Principle 1
Publicly-funded research data are a public good, produced in the public interest, which shall be made openly available and accessible with as few restrictions as possible in a timely and responsible manner that meets a high ethical standard and does not violate privacy or harm intellectual property.

Principle 2
Institutional and project-specific data management policies and plans shall be in accordance with relevant standards and community best practice. Data with prospective long-term value shall be properly curated to remain accessible and usable for future research.

Principle 3
To ensure that research data can be effectively re-used by others, sufficient metadata must be recorded and published openly to ensure that research data are both discoverable and can be independently understood without recourse to the creator. Published results shall always include information on how to access the supporting data and/or the associated metadata.

Principle 4
ESRC recognises that there are legal, ethical and commercial constraints on release of research data. To ensure that the research process is not damaged by inappropriate release of data, research organisation policies and practices shall ensure that these constraints are considered at the initiation of the research process and throughout both the research and data life cycles.

Principle 5
To ensure that research teams get appropriate recognition for the effort involved in collecting and analysing data, those who undertake ESRC-funded work may be entitled to a limited period of privileged use of the data they have collected to enable them to publish the results of their research. This period of privileged use shall not preclude the publication of metadata at the earliest opportunity.

Principle 6
In order to recognise the intellectual contributions of researchers who generate, preserve and share key research datasets, creators of these data must provide adequate and persistent information for the research data to be cited, and all users of research data must acknowledge the sources by formally citing the data used, and abide by the terms and conditions under which they are accessed.

Principle 7
It is appropriate to use public funds to support the management and sharing of publicly-funded research data. To maximise the research benefit which can be gained from limited budgets, the mechanisms for these activities shall be both efficient and cost-effective in the use of public funds.

Principle 8
In general data which supports published research outputs shall be findable and accessible at the same time as the published research outputs themselves.

Principle 9
Publishers of research data shall provide adequate and persistent information for the research data to be cited, to support best research practice and integrity.

The Managing Research Data guide series comprises:

- An Introduction to Managing Research Data – For Researchers and Students
- Data Management Planning – AHRC funding applicants
- Data Management Planning – BBSRC funding applicants
- Data Management Planning – EPSRC funding applicants
- Data Management Planning – ESRC funding applicants
- Data Management Planning – MRC funding applicants
- Data Management Planning – NERC funding applicants
- Data Management Planning – STFC funding applicants
- Data Management Planning – Non-RCUK funding applicants

They are part of a range of RDM material produced by the University, all available via www.le.ac.uk/researchdata.