

Towards Open Research: what ESRC-funded researchers tell us

Practices, experiences, barriers and opportunities for sharing and reuse of data
and code and for open access publishing

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Summary

Data experts from the UK Data Service and the London School of Hygiene and Tropical Medicine have been working together on a project to investigate researcher's attitudes and behaviours towards open research. Commissioned by the Wellcome Trust, the project considered the sharing and reuse of research data, code, and open access publications in order to identify practical actions research funders can implement to remove barriers and motivate researchers to practice more open research.

The project gathered evidence from 583 Wellcome Trust-funded and 259 ESRC-funded researchers via an online survey and focus group discussions. This report describes the survey responses of ESRC-funded researchers.

The findings suggest that open research practices are increasing, with 55% of researchers in the survey sharing data and 41% sharing code, and benefits of sharing outweigh barriers for most. They report new collaborations and increased citation rates as benefits from data sharing, and sharing data being seen as good research practices, and facilitating replication and validation of research as strong reasons to share data. Whilst lack of participant permission to share data and the sensitivity of data remain as barriers, very few researchers have actually had direct bad experiences from data sharing. However, researchers noted that preparing data for reuse could be time consuming and costly.

Code sharing is more in its infancy, is being practised less and is seen to result in fewer benefits, but is also less problematic for researchers. No significant barriers to code sharing exist, other than the time, funding and skills needed to prepare code for sharing, especially due to rapid software changes that makes long-term validity challenging. Additional funding and assistance to prepare data and code for sharing, knowing how other researchers reuse the data and code and rewards and recognition for practising open research would motivate researchers to make research data and code more readily available.

Thanks to parallel surveys carried out amongst researchers funded by the Wellcome Trust and by ESRC, we were able to show that the influence of ESRC's mandatory data sharing policy and data infrastructure to support it means that ESRC-funded researchers tend to reuse more existing data and suffer less from lack of skills to share data. For Wellcome-funded researchers, the lack of suitable data repositories is an important barrier.

Recommendations to ESRC and UKDS include providing expert guidance and support for data preparation and management (especially on ethics, disclosure review, confidential and qualitative data) and showcasing examples of data sharing to allow researchers to see how data is being used in their research community. To promote more data reuse, easier discoverability of suitable data, a wider range of data being available for reuse, and more funding specifically for secondary analysis are recommended.

Key findings

Publishing papers

- Journal reputation, journal audience, journal impact factor and the quality of the peer review process are key factors when researchers decide in which journal to publish their work (papers)
- Content quality, journal and author reputation are the most important factors when selecting papers to read/cite for research
- The availability of data alongside a paper is (still) of minimal importance when publishing or consulting papers
- 59% of papers are published as open access; 25% of researchers publish all papers as open access

Data sharing

- 55% of researchers surveyed reported to make the data they produce available
- Researchers that do not make data available are more likely to do qualitative research
- Data sharing increases with length of research career
- Only 27% of those that make data available do so via the UK Data Service; most data are made available in disciplinary and institutional repositories
- Most important reasons to make data available are: funder requirement, it being considered to be good research practice, to enable collaboration with other researchers and to enable replication and validation of research
- More than half of those respondents that share data experience no personal benefit from data sharing; those that do report personal benefits score new collaborations and higher citation rates as main benefits
- Most researchers have also not had any bad experiences from making data available to other researchers
- Seventeen respondents have had bad experiences from data sharing: wrong/inappropriate re-analysis, lack of acknowledgement or citation, criticism from data re-users, time consuming to prepare data and support re-users, institution not being supportive, effort required to draw up confidentiality agreements, difficult to agree upon documentation standards in a consortium, delays at UKDS end to curate and release data
- Main barriers to data sharing are not having participant permission to share data, data being confidential or sensitive and the time, effort and cost needed to prepare data for sharing
- Respondents score the benefits of data sharing as significantly more important than barriers
- Motivations to make more data available in future are: funding to cover the cost for data preparation, assistance from institutional or funder staff to prepare data, knowing how others use the data, evidence of data citation and co-authorship on papers resulting from reuse
- ESRC and UKDS can help researchers share more data through expert support and guidance on data management, data preparation and in particular on ethics, the sharing of confidential data, the anonymization of qualitative data, disclosure reviews and liaising with ethics committees
- Also additional funding for data preparation, feedback on how data are reused, good acknowledgement and citation practices and ensuring responsible reuse are important to encourage more data sharing

Data reuse

- Reuse of existing data is primarily for background or context of research, for new analysis, in teaching materials and to develop methodologies
- A quarter of respondents have never reused data
- Data are obtained more upon request from the data creator or from colleagues than from the UK Data Service
- It is important that data are from a reputable source, are of high quality and well documented; open and/or immediate access is less important
- ESRC and UKDS can promote more data reuse in research by making it easier to find and access relevant data; a wider range of data being available (such as biomedical and medical data, big data, video data, and data with multilevel longitudinal components); more funding for secondary analysis projects; and by training and networking on secondary analysis.

Code sharing

- 41% of researchers that produce code also make it available, via generic or institutional repositories
- Main reasons for sharing code mirror those for sharing data: to enable collaborations, as good research practice and to enable replication and validation
- Main barrier to code sharing are the time and effort required to prepare code for sharing, as well as insufficient funding and skills to do so
- Benefits of code sharing are scored significantly higher than barriers
- Most respondents gain no personal benefits from code sharing; those that do report benefits score higher citation rates and new collaborations as main benefits
- Motivations to make more code available in future would be funding to cover the cost for code preparation , enhanced academic reputation, knowing how others use the code and assistance from institutional or funder staff to prepare code.
- To promote more code sharing, there is a clear need for guidance, training and technical support on how to prepare code for reuse, how to document it, which formats or standards are optimal, and have independent experts check the code to promote more code sharing.
- Also showcasing reuse and providing clear requirements on how and where to deposit code are wanted.

Code reuse

- Thirty percent of respondents have reused code
- Code is obtained from colleagues, from a community repository or upon request from the code creator
- In reuse it is of prime importance for code to be well documented and from a reputable source

Recommendations for the UK Data Service

Based on the findings of this survey, the following recommendations on data and code sharing and reuse can be concluded.

To motivate and promote more data sharing, the UK Data Service should continue to:

- promote itself as a service that can help researchers achieve what they consider to be important reasons to share both data and code: it being considered good research practice and enabling replication and validation of research;
- remedy the barriers to data sharing through expert support and assistance to researchers on the sharing of sensitive and confidential data;
- target activities towards what clearly motivates researchers to share more data: showcase data reuse by researchers, ensure good practices in citation and co-authorship when data are reused and providing assistance to prepare data for sharing.

Recommendations given by respondents indicate an ongoing need for the UK Data Service to provide proactive and expert data management and data preparation support to researchers; with more hands-on support. The responses also show that certain misconceptions still prevail, such as that budgets in research proposals for data preparation are not available, and that qualitative data cannot be shared and reused. There is therefore a need to ensure that messages are clear and reach the right audiences at a time when research is being planned. University research offices can further help support this core message

When showcasing how existing data are reused in research, this should provide specific examples of how, other than new analysis, data can be used for gleaning context and background information for new research, for creating teaching materials and to develop methodologies.

To promote more data reuse, the UK Data Service should build on its existing work to:

- promote its data holdings and make the data easier to be discovered, as researchers are at present often more likely to obtain data directly from the data owner;
- widen the range of data made available by reaching out to new data creators;
- improve levels of documentation to facilitate better knowledge about context;
- provide more dedicated secondary analysis training, for example in conjunction with the ESRC National Centre for Research Methods.

Some specific suggestions made include systems to assess the quality of data and facilitating better linkage of key data resources. ESRC on the other hand can continue to promote more data reuse through funding streams, like the existing Secondary Data Analysis Initiative which has been successful in promoting exploitation and reuse of major data resources.

To promote more code sharing and reuse, ESRC and the UK Data Service should:

- implement clear requirements and guidance on code sharing expectations from ESRC grants;
- specify where and how code should be deposited, for example via the UKDS syntax upload facility for syntax resulting from data reuse;
- provide training and guidance on preparing code for sharing and documenting it.

1. Introduction

This report presents the findings of a survey carried out amongst researchers funded by the Economic and Social Research Council (ESRC), investigating researchers' attitudes and behaviour towards open research, the sharing and reuse of research data and code and open access publishing of papers. It provides detailed information on researchers' current opinions and practices that can be used to refine and drive the strategies of the UK Data service and ESRC.

The survey was carried out in parallel to a survey with researchers funded by the Wellcome Trust (Van den Eynden et al 2016), using the same questionnaire.

The specific objectives were to study:

- attitudes of researchers to the idea of open research, in particular sharing of data, sharing of code, and sharing of papers;
- current open research practices applied by researchers;
- barriers that inhibit or prevent researchers from practising open research;
- researcher-focused incentives and motivators for practising open research;
- practical actions the ESRC and UKDS can take to remove or mitigate barriers and maximise the opportunities for practising open science.

2. Methodology

ESRC provided us with a list of 927 current holders of research grants and fellowships. No holders of studentships were included in the list. All grant holders in the lists were invited to participate in the online survey, with two reminders sent.

The survey instrument (Van den Eynden, Knight and Vlad 2016) was designed based on extensive literature review and input from experts on the project's advisory committee. This means that many targeted questions were asked, based on known data and code sharing practices, barriers and motivations well reported in literature, in order to obtain quantifiable agreement or disagreement with this existing knowledge across our population of researchers. The questionnaire (Van den Eynden, Knight and Vlad 2016) contains single-response and multiple-response multiple-choice questions and Likert scales with a 5-scale response mode (ranging from 'not at all important' to 'extremely important'). Each question also provided the ability for respondents to add other options or choices with free text descriptions. The instrument also has six open questions, asking researchers to give their views on the future of publishing and actions funders and UKDS could take to advance open research:

- In just a few words, what single thing would encourage you to publish more of your work in fully Open Access journals?
- In just a few words, what would you change about the scholarly publishing system if you were able to?
- Overall, what one or two key things could research funders do to help you make more data available in a repository or other online form?
- What single thing would encourage you to reuse more existing data in your research?
- What can ESRC and the UK Data Service do to help you reuse more existing data in your research?

- Overall, what one or two key things could research funders do to help you make more code available in a repository or other online form? In just a few words, what single thing would encourage you to publish more of your work in fully Open Access journals?

The survey was available online for a month from 8 August until 12 September 2016. After the initial invitation, two reminders were sent: one two weeks after the launch of the survey, and the second reminder 4 days before the closure of the survey. We received 259 responses (27.9% response rate). This provides a representative sample at confidence level 95% with 5.2% margin of error.

Survey results were exported from Qualtrics, with cleaning, coding and analysis carried out in SPSS. Significant associations between categorical variables from multiple-choice questions were tested through cross-tabulation of variables, with a Pearson's chi-square test done to test dependence of variables ($P<0.05$). For continuous scale variables such as numbers of papers published and numbers of datasets and code packages shared, ANOVA tests were used. For Likert scale questions, differences of averages (indicating overall level of importance) were analysed using ANOVA tests. The six questions eliciting free text responses were coded and analysed in NVivo.

3. Characterising respondents

On average respondents have been working in research for 19 years (Fig 1); 86.5% of respondents carry out research in the UK, 12% in low and middle income countries and 1.5% in non-UK high income countries.

Researchers use a range of methodologies, which are strongly determined by the research discipline (Fig 2). Chi-square tests show significance for certain methods being used more in certain disciplines. Across the respondents and with the ability to select multiple responses, 65% use qualitative research methods, 53% carry out secondary analysis, 50% use surveys, 43% use observations, 33% experiments and 11% simulations. Disciplinary differences are:

- political scientists predominantly use qualitative methods (34%), followed by surveys (23%) and analysis of secondary data (21%);
- psychology researchers mostly use experiments (34%) followed by surveys (19%);
- population or public health researchers mostly use surveys and secondary analysis (29%)
- humanities researchers predominantly use qualitative methods (38%) as well as surveys and secondary analysis (23%);
- social scientists, the largest sub-sample, predominantly use qualitative methods (32%), followed by observations (20%), surveys, and secondary analysis (18%);
- economists use mostly secondary analysis (29%), with experiments and simulation used just as much (16%);
- linguists chose observations (24%) qualitative methods and experiments in equal amounts (19%).

Besides receiving research funding from ESRC, responding researchers have in the last five years also been funded by public research funders (68%), their own institution (57%), charities and not-for-profit organisations (45%), private funders (18%) and industry (10%).

Figure 1. Respondent's length of research experience (N=259)

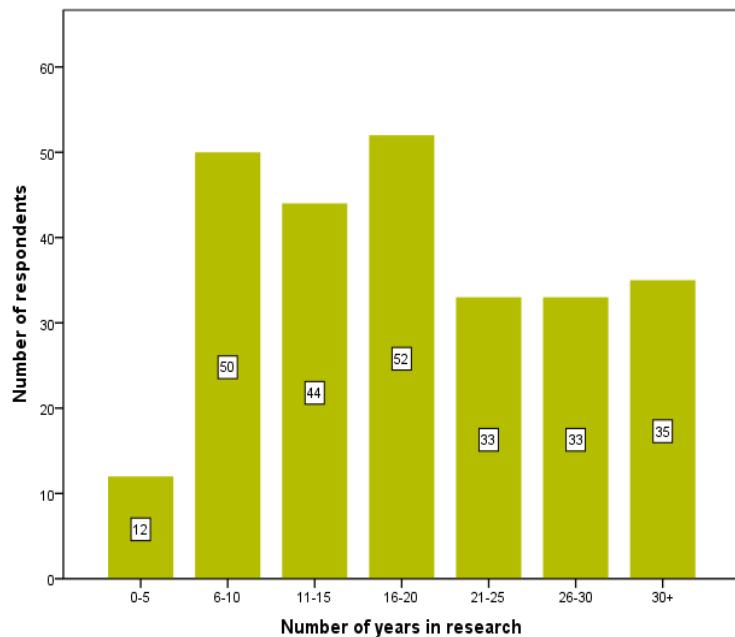
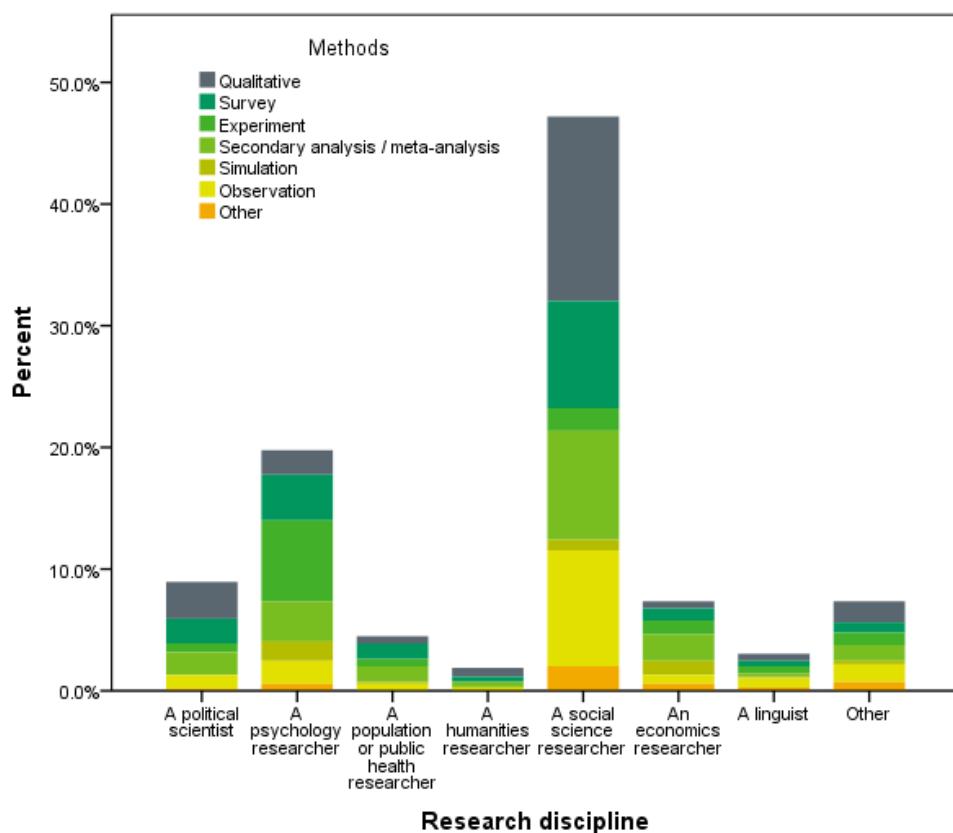


Figure 2. Research methods by discipline, as percentage of respondents (N=259)



4. Open access publishing

Respondents have published on average 14 peer-reviewed papers over the last 5 years), of which 59% were published as open access papers, with a strong positive relationship² between the number of papers published and the proportion of these papers published as Open Access (OA). Twenty-five percent of respondents have, over the last five years, published all their papers as open access papers. When papers have not been published as open access papers, this is due to lack of funding to cover the article processing charges (APCs) (48%), the journal not having an open access option (35%) or since papers are being uploaded to social network platforms such as ResearchGate, Academia, Mendeley, etc. (24%) (Fig 3). Only 35% of researchers report having used RCUK institutional block grant funding to cover article processing charges (APC) to publish papers resulting from ESRC grants as open access. There is, however, an association between using funding to cover APCs and research discipline, with psychologists and population and public health researchers being more likely to have used RCUK institutional block grant funding to cover article processing charges (APC).

Comparing with Wellcome Trust funded researchers, those researchers publish on average more papers (18 over last 5 years) and publish a significantly higher percentage of their papers as open access (73 versus 59%), but if restricting this only to researchers in the humanities and social sciences, then the difference is not significant (63% and 59% resp.).

Journal reputation, journal audience, journal impact factor and the perceived high quality of the peer review process are key factors when researchers decide in which journal to publish their work (Fig 4). Respondents quote these factors as being very to extremely important on a Likert scale of five degrees of importance. Being able to publish papers for free or at low cost, or journal expecting corresponding data to be available have minimal importance. When choosing papers to read and cite, content quality as well as journal and author reputation were listed as most important factors (Fig 5). Interestingly, almost half of respondents (42%) consider that availability of the data underpinning publications is not at all important; also a paper being available through open access is only slightly to moderately important.

New features that respondents think are important in future research publication systems are commentary and discussion forums for published papers and the online publication of preprints (that can later be submitted to a journal) (Fig 6).

Based on 232 coded free text responses provided via the survey by respondents to the question “What single thing would encourage you to publish more work in fully open access (OA) journals?”, the principal motivators are the reputation of open access journals (24%), lower or no publication charge (24%), the availability of funding to cover APCs (21%), an easier publication process (9%), the availability of more open access journals in their discipline (6%) and open access journals having a higher impact factor (6%).

Changes researchers would like to see in the scholarly publishing system, based on 225 free-text responses given to the question “What would you change about the scholarly publication system if able to?” are principally: a quicker publishing process (12%), a quicker peer review process (9%), a more open or transparent peer review system (8%), lower or no cost (8%), for publishers not to profit (6%) and reward or pay for peer reviewers (6%).

² Correlation coefficient of .67(significant at 1%)

Figure 3: Reasons for not publishing papers as open access, as percentage of respondents (N=252)

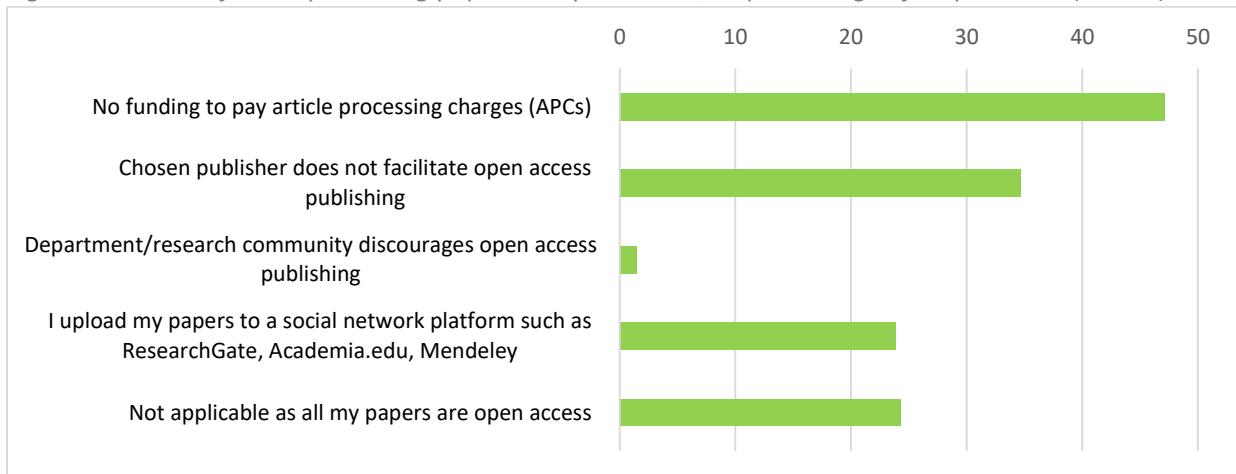


Figure 4: Importance of factors when choosing a journal in which to publish

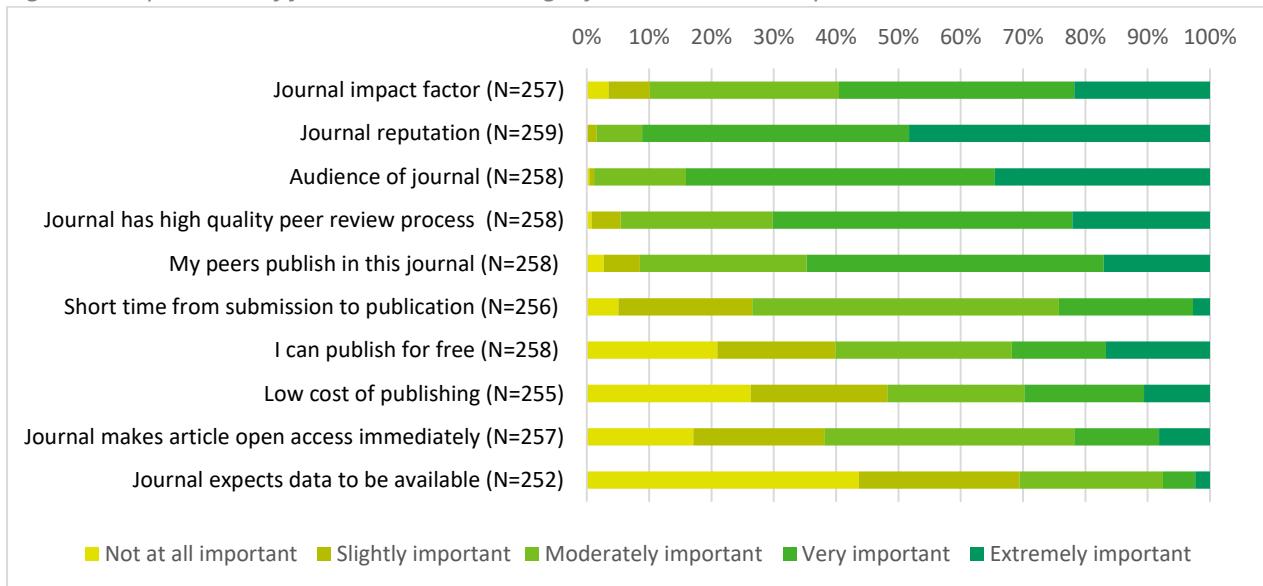


Figure 5: Importance of factors when selecting papers to read and cite

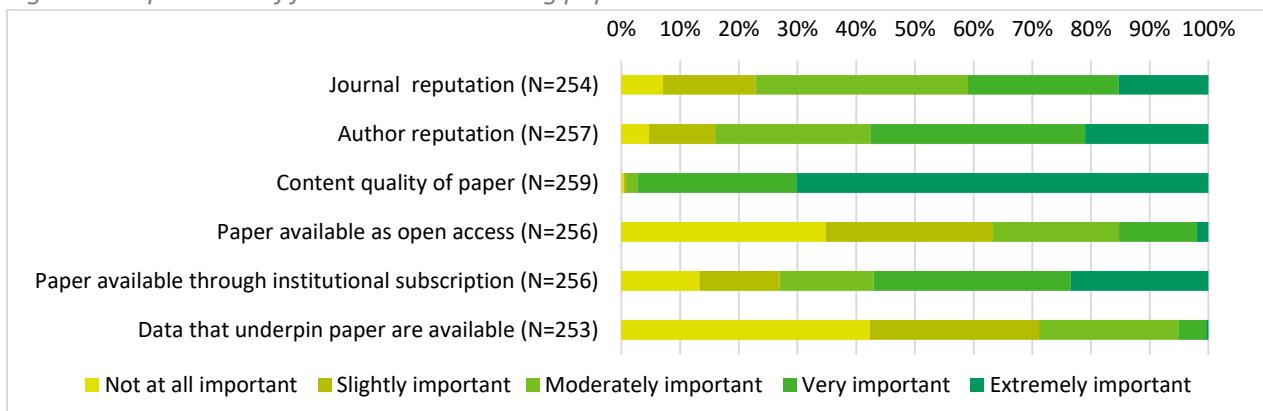
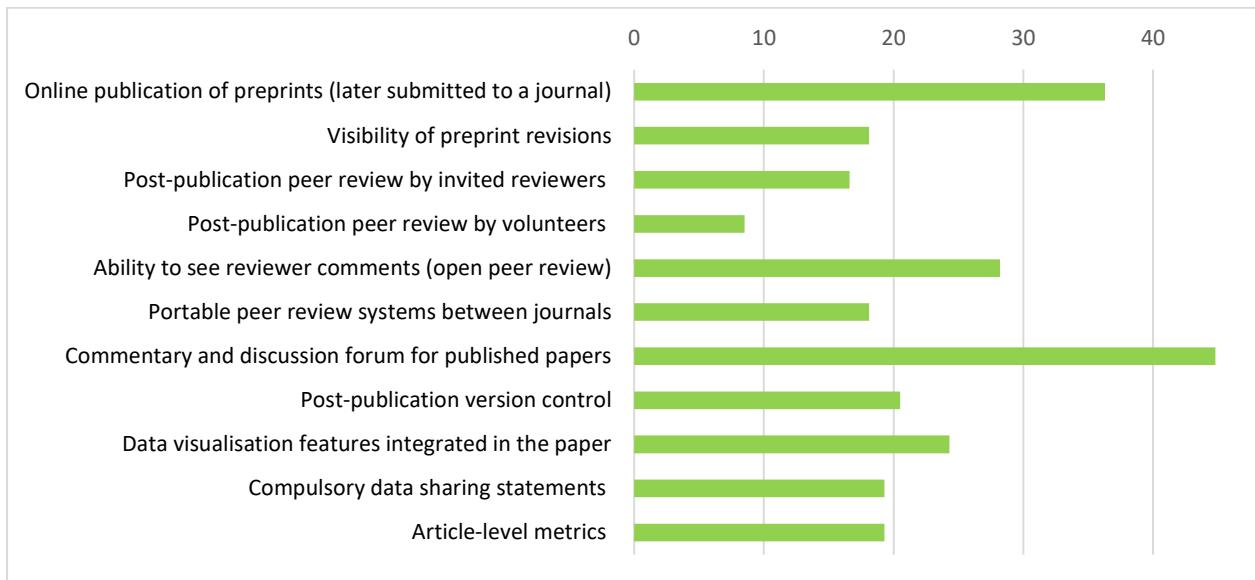


Figure 6: New features deemed important in future publication systems, as percentage of respondents (N=231)



5. Data sharing attitudes and practices

Ninety-four percent of respondents generate data in their research (Fig 7), and 55% of them have over the last five years made data available to the research community through a repository, data archive, journal, website, online database or other online form (N=134). Researchers that have not shared data at all are significantly more likely to use qualitative research methods and generate qualitative data, which 67% of respondents do (Fig 7). Researchers using simulations and experiments are most likely to share their data (81% and 69% resp.).

Over the last five years, a researcher has on average made two datasets available. Career stage strongly influences data sharing, with more datasets made available the longer a person is in research (Fig 8).

Datasets are mainly made available as full datasets (55%) and as open access (66%) (N=134). Also subsets (42%) or a subset linked to a particular publication (26%) are made available. Besides open access, access may be upon request (28%), to registered users (18%) or only to immediate collaborators (5%).

Data are principally made available in community/disciplinary repositories (43%), whereby 27% are made available via the UK Data Service. Besides this, data are also made available via institutional repositories (39%), a private repository or website (20%) or via generic repositories (10%) (N=134).

The most important reasons for respondents to make their data available are funder requirement, it being considered to be good research practice, to facilitate collaboration with other researchers and to enable validation and replication of research (Fig 9). Journals expecting data to be available is an important reason for economics and psychology researchers.

The main benefits that respondents have personally experienced from making data available are new collaboration (27%) and higher citation rates (22%). Most respondents (52%), however, have not personally experienced any benefit from making their data available (Fig 10).

At the same time, most researchers (87%) have also not had any bad experiences from making data available to other researchers. Except for 17 respondents who report as bad experience: wrong/inappropriate re-analysis (5), lack of acknowledgement or citation (5), criticism from data re-users (2), time consuming to prepare data and support re-users (1), institution not being supportive (1), effort required to draw up confidentiality agreements (1), difficult to agree upon documentation standards in a consortium (1), delays at UKDS end to curate and release data (1).

The main barriers to data sharing are: not having research participant permission to share data; data containing confidential or sensitive information; and the time and effort required to prepare data (Fig 11). There are noticeable differences with social science researchers funded by the Wellcome Trust, who consider the lack of skills to prepare data for sharing as an important barrier. This indicates that the efforts of the UK Data Service to increase skills in data management and curation significantly help in facilitating research data being available for reuse. For population and public health researchers, data confidentiality and third party rights in the data are significantly more important barriers.

The main factors that would motivate respondents to make more data available in future are: funding to cover the cost for data preparation (74%); assistance from institutional or funder staff to prepare data (60%); knowing how others use the data (58%); evidence of data citation (52%); and

co-authorship on papers resulting from reuse (48%) (N=242) (Fig 12). These motivations are very different from Wellcome Trust-funded respondents, where enhanced academic reputation is a much stronger motivator.

When asked what research funders can do to help researchers make more data available, 204 respondents provided free-text responses in the survey. The suggestions made were coded and could be grouped into three main areas:

- support with data preparation and data management (60%) to make data ready for reuse; examples given of the support respondents feel they need is either staff (expert or in house) to help prepare data, and guidance and expertise on ethics, the sharing of confidential data, the anonymization of qualitative data, disclosure reviews and liaising with ethics committees;
- additional funding for data preparation (47%);
- ensuring responsible reuse of data (and no misuse), with proper citation and acknowledgement, and feedback given on reuse of data (21%).

This shows the ongoing need for the UK Data Service to provide proactive and expert data management and data preparation support to researchers; possibly also hands-on support. The responses also show that certain misconceptions still prevail, such as that budgets in research proposals for data preparation are not available (whilst ESRC's position is that data preparation should be budgeted in a grant application), and that qualitative data cannot be shared/reused (when we provide much guidance on how such data can be shared in an ethical manner). There's therefore a need to ensure that messages are clear and reach the right audience at a time when they need this (i.e. when research is being planned). University research offices can further help support this core message.

Figure 7: Types of data generated by respondents, as percentage of respondents (N=259)

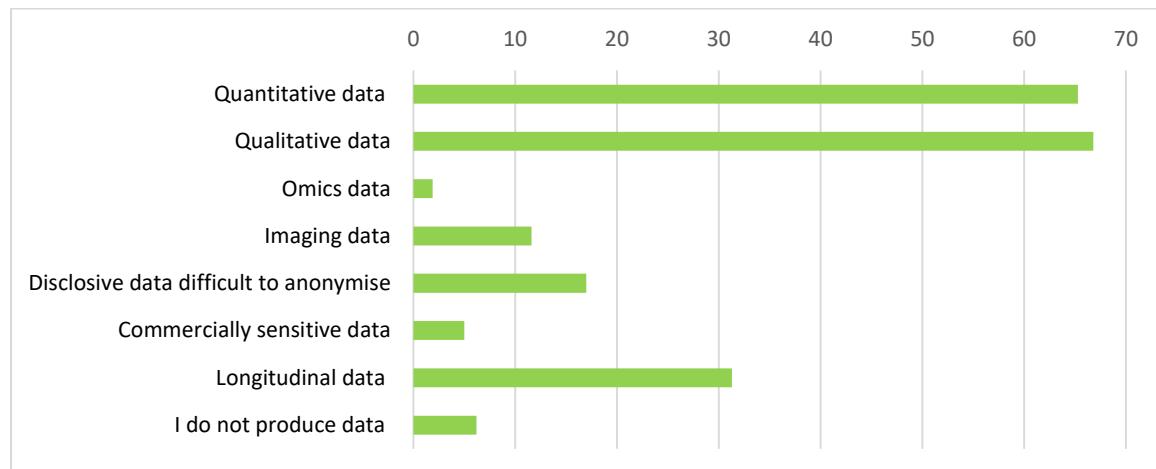


Figure 8. Average number of datasets researchers have made available over the last five years according to career stage (N=243)

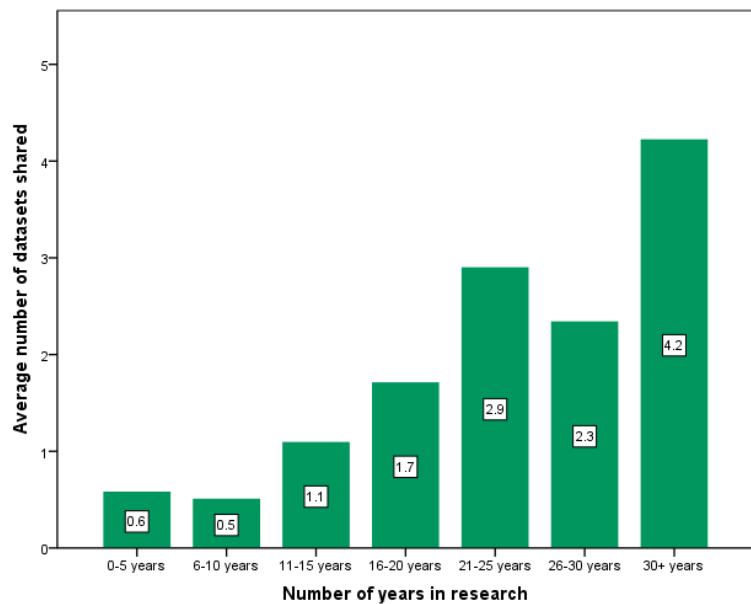


Figure 9: The importance of reasons for making data available

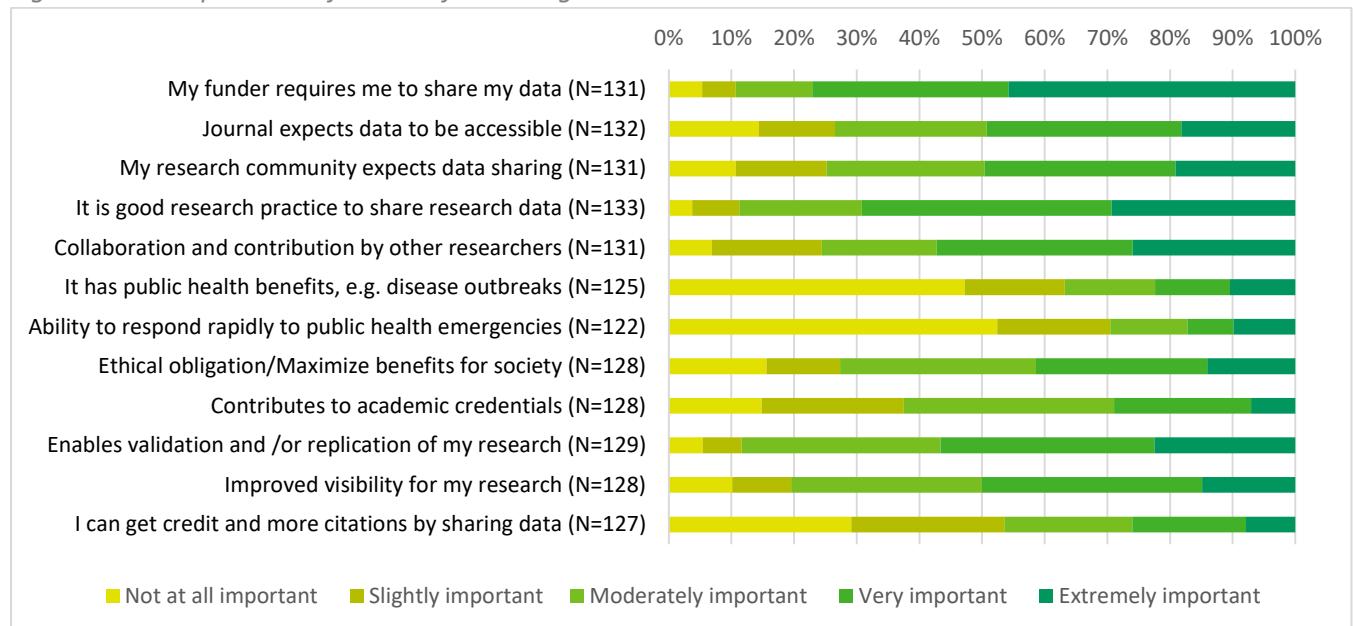


Figure 10. Benefits personally experienced by respondents from making data available, as percentage of respondents (N=134)

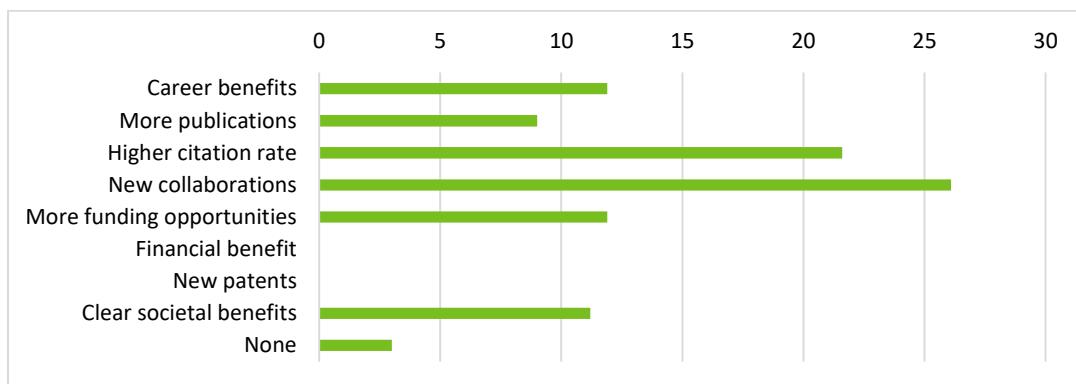


Figure 11: Barriers to making data available

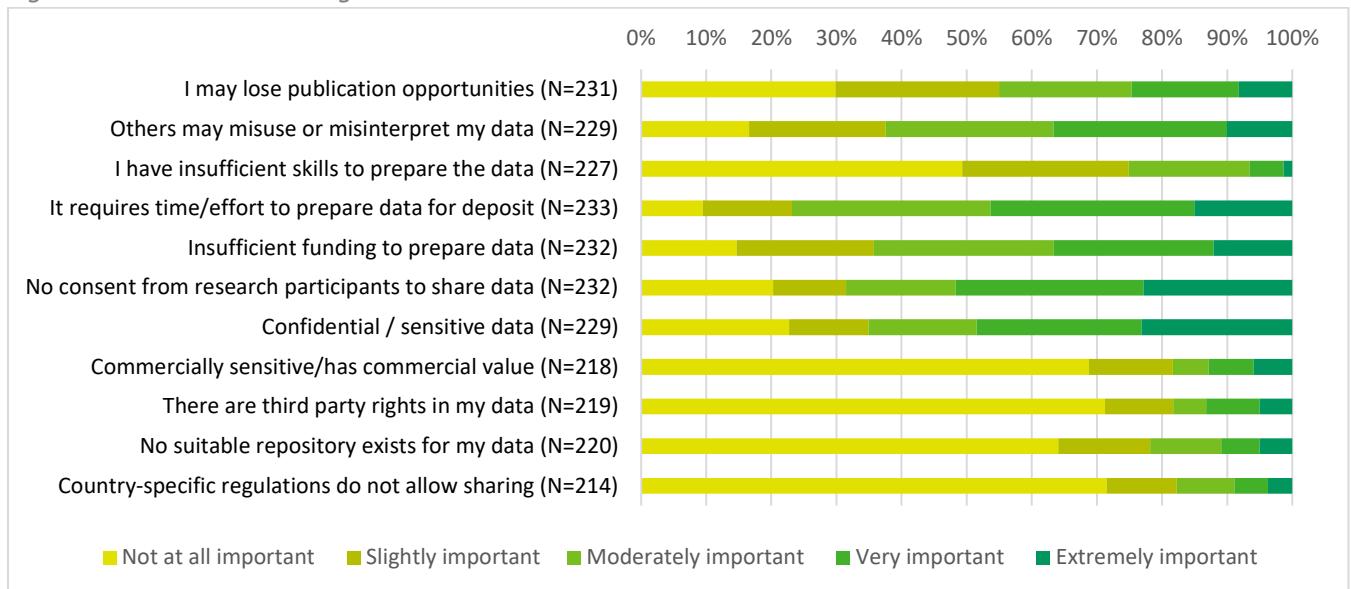
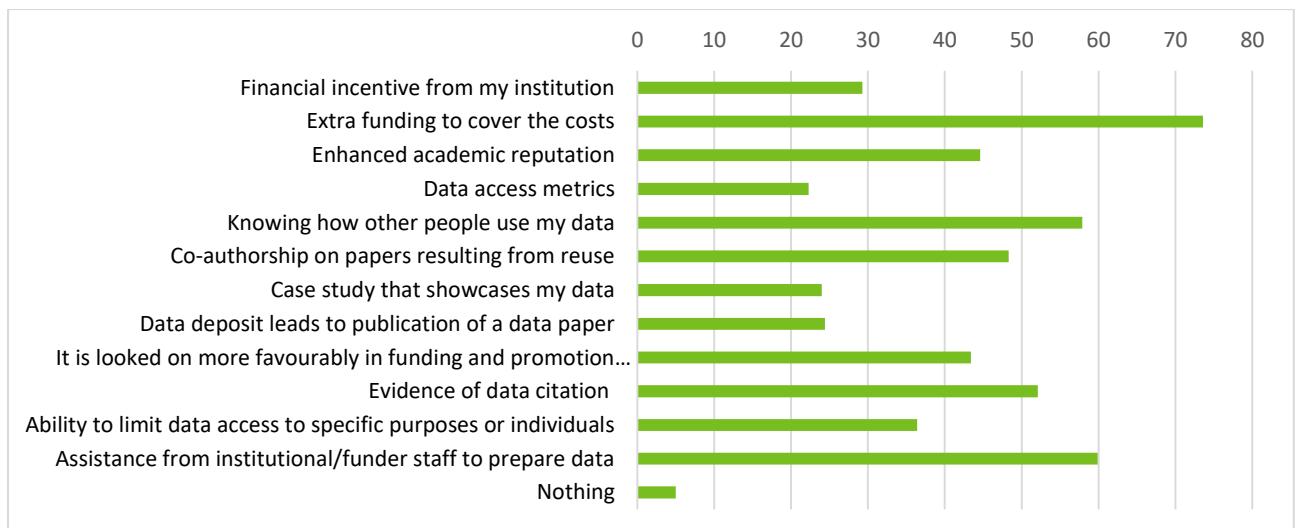


Figure 12. Factors that would motivate respondents to make more data available in future (N=242)



6. Data reuse

Reuse of existing data is primarily for background or context of research (48%), for new analysis (35%), in teaching materials (32%) and to develop methodologies (31%) (N=258); and 23% of respondents have never reused existing data (Fig 13). In comparison, Wellcome Trust-funded humanities and social sciences researchers are more likely to never have reused existing data and ESRC-funded researchers are more likely to reuse data as teaching material. How data are reused is strongly determined by the research methods used:

- researchers using surveys in their research are more likely to reuse existing data for meta-analysis, new analysis and as baseline data
- researchers using experiments are more likely to reuse existing data for meta-analysis and replication
- researchers doing secondary-analysis are more likely to reuse existing data for validation and replication, for new analysis and meta-analysis, as baseline data, for background and context and to develop methodologies
- researchers using simulations in their research are more likely to reuse existing data for validation and replication, as baseline data and for new analysis
- researchers doing observations are more likely to use existing data for background and context.

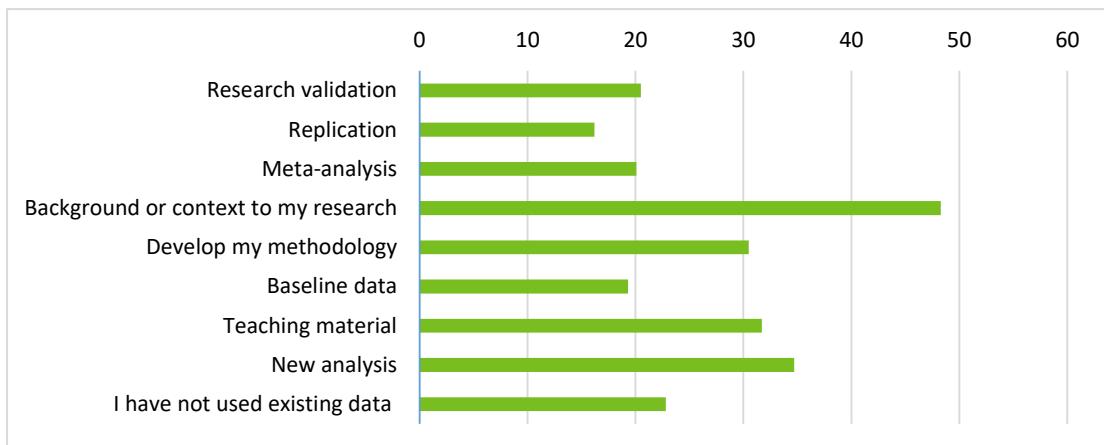
Data are mainly obtained upon request from the data creator (48%), from colleagues (47%) and from the UK Data Service (41%) (N=199). Aspects that are deemed important in reuse of data are the fact that data are obtained from a reputable source (81%), are of high quality (77%) and well documented (76%) (N=199). Data being openly accessible (49%) being immediately accessible (36%) are less important factors for researchers in comparison.

When asked what would encourage them to reuse more existing data in their research and what ESRC and UKDS can do to promote this, 193 respondents provided free text responses, with as principal suggestions:

- to make it easier to find and access relevant data (30%)
- data being available that are relevant for the research (28%), with suggestions for UKDS to have a wider range of data available such as biomedical and medical data, big data, video data, and data with multilevel longitudinal components
- more funding for secondary analysis projects and to train researchers in secondary analysis; and also to make more data accessible with good documentation (16%)
- enhance the reputation of secondary analysis versus primary data collection (10%)
- training and networking on secondary analysis (11%)

These responses suggest that UKDS can do more to promote its data holdings and make them easier to be discovered, can still widen the range of data made available, can improve levels of documentation, and can add specific secondary analysis training to its training portfolio, for example in collaboration with the ESRC National Centre for Research Methods. Some specific suggestions made include systems to assess the quality of data and facilitating better linkage of key data resources. ESRC on the other hand can promote more data reuse through funding streams, such as via continuation of the Secondary Data Analysis Initiative (SDAI).

Figure 13. How respondents reuse existing data, as percentage of respondents (N=259)



7. Code sharing

Forty-one percent of respondents produce code in their research. This is significantly associated with the research discipline as well as with different research methods used: public health researchers and economists are more likely to produce code. Researchers using simulations, experiments, secondary analysis and surveys are more likely to produce code.

Another 41% of those producing code also share it (N=105). On average, respondents have made 2.5 code packages available over the last five years (N=105). Code is mainly made available in a generic repository such as GitHub or an institutional repository.

The main reasons why researchers make their code available are to enable collaborations, for it being good research practice, as well as for replication and validation of their research (Fig 15).

The main barrier researchers have to share their data is the time and effort required to prepare their code for sharing, as well as insufficient funding and skills (Fig 16). Also here, benefits are scored significantly higher than barriers.

Forty-five percent of respondents did not recognise any personal benefits from code sharing activities (N=42). Amongst those that do, higher citation rates and new collaborations are the main benefits (30%) (Fig 17). Only two respondents report a bad experience from code sharing: reuse without citation and the effort to deal with questions from re-users (N=42).

The main factors that would motivate respondents to make more code available in future are fairly similar to those for data: funding to cover the cost for code preparation (63%), enhanced academic reputation (44%), knowing how others use the code (42%) and assistance from institutional or funder staff to prepare code (41%) (N=104) (Fig 18).

When asked what research funders can do to help researchers make more code available, 71 respondents provided free-text responses in the survey. The suggestions made were coded and could be grouped into three main areas:

- support (92%) through guidance, training and tools (32%), financial support (23%) and technical support on how to prepare code for reuse, how to document it, which formats or standards are optimal, and have independent experts check the code
- demonstrate the purpose or value of sharing code (24%), e.g. by showcasing reuse
- make it a requirement or have a code of practice on code sharing, and make it clear where code should be deposited (14%).

The ESRC and UK Data Service could provide clear guidance on requirements for code sharing from ESRC grants, building on the existing UK Data Service requirement for deposit of syntax for derived variables resulting from data reuse, via the syntax upload facility.

Figure 15: The importance of reasons for making code available

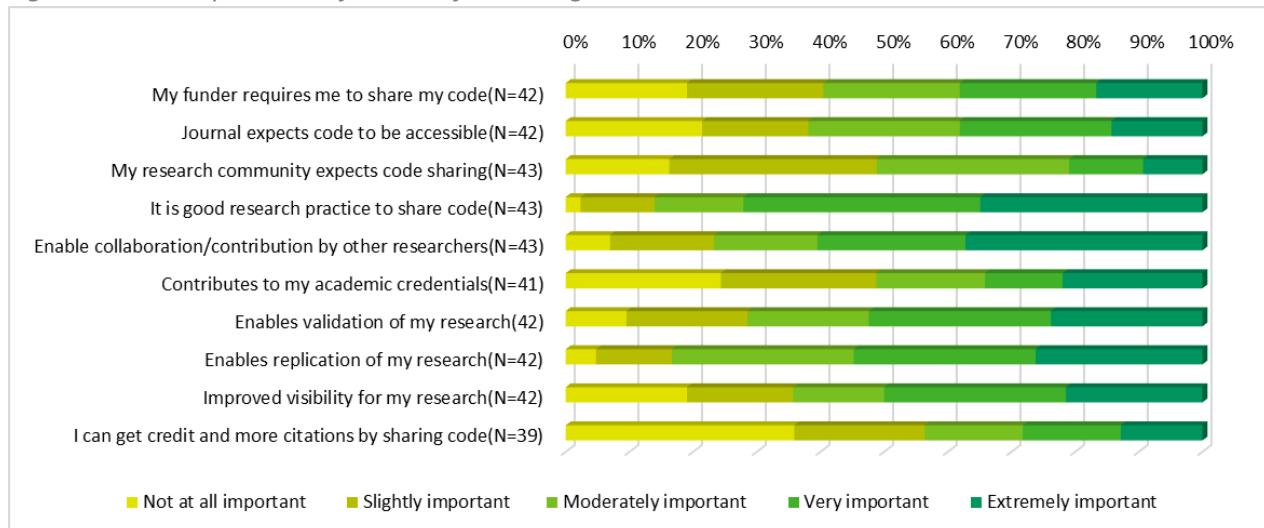


Figure 16: Barriers to making code available

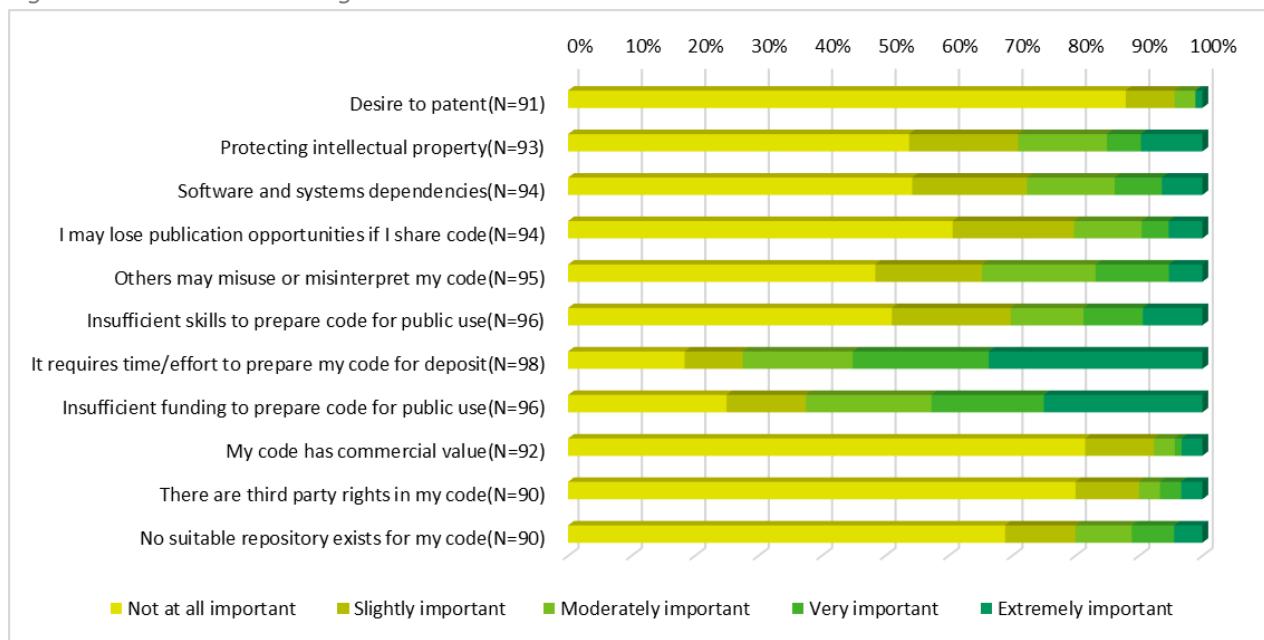


Figure 17. Benefits personally experienced by respondents from making data available, as percentage of respondents (N=43)

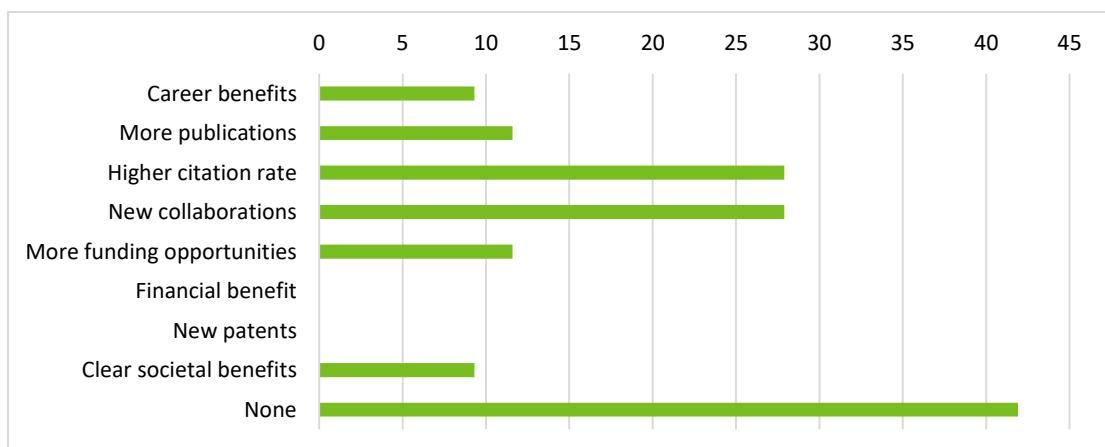
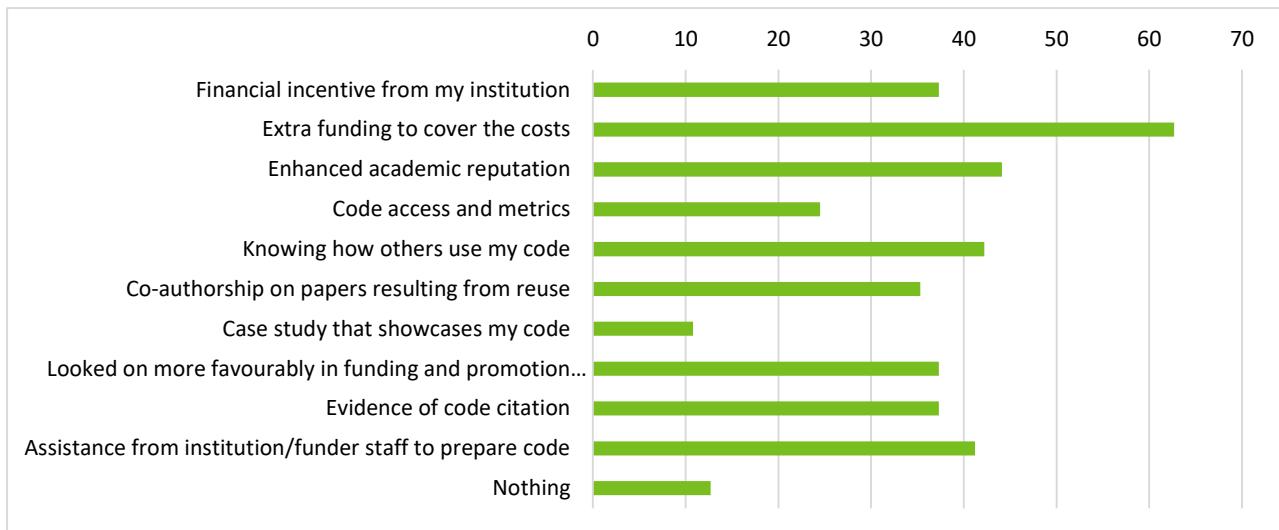


Figure 18. Factors that would motivate respondents to make more data available in future (N=102)



8. Reuse of code

Thirty percent of respondents have reused code (259), which they obtain from colleagues (60%), from a community repository (36%) or upon request from the code creator (32%).

In reuse it is of prime importance for code to be well-documented (91%), to be from a reputable source (72%) and openly accessible (47%).

References

Van den Eynden, V., Knight, G. and Vlad, A. (2016). Open Research: practices, experiences, barriers and opportunities. [Data Collection]. Colchester, Essex: UK Data Archive. [10.5255/UKDA-SN-852494](https://doi.org/10.5255/UKDA-SN-852494)

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