

BMJ Open Publishing priorities of biomedical research funders



Ellen Collins

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ABSTRACT

Objectives: To understand the publishing priorities, especially in relation to open access, of 10 UK biomedical research funders.

Design: Semistructured interviews.

Setting: 10 UK biomedical research funders.

Participants: 12 employees with responsibility for research management at 10 UK biomedical research funders; a purposive sample to represent a range of backgrounds and organisation types.

Conclusions: Publicly funded and large biomedical research funders are committed to open access publishing and are pleased with recent developments which have stimulated growth in this area. Smaller charitable funders are supportive of the aims of open access, but are concerned about the practical implications for their budgets and their funded researchers. Across the board, biomedical research funders are turning their attention to other priorities for sharing research outputs, including data, protocols and negative results. Further work is required to understand how smaller funders, including charitable funders, can support open access.

In the spring of 2013, BMJ commissioned the Research Information Network to interview 10 major funders of UK medical research to identify their key priorities for open access and for broader scholarly communications. The funders are outlined in table 1.

This report outlines the most important findings from that research, and is being made openly available by BMJ in order to support and inform the debate about how to ensure that the outputs of medical research are available to the widest possible group of people.

OPEN ACCESS POLICIES

Public and charitable sector organisations had clear open access policies for their funded research; commercial funders tend not to have policies but are supportive of open access

Both the public sector organisations that we spoke to had OA policies in place for a number

ARTICLE SUMMARY

Strengths and limitations of this study

- The semistructured interview offers an in-depth insight into the views and policies of research funders.
- The small sample size means it is not possible to generalise the findings.
- Restricted to the UK only; no international dimension.

of years. Both feature a maximum 6-month embargo period and deposit into, in the Medical Research Council's (MRC's) case, Europe PMC, and in the National Institute for Health Research's (NIHR's) case, Europe PubMed Central (PMC) or the NIHR Journals Library. Both organisations are prepared to consider funding Gold OA fees; the NIHR is considering moving towards Gold OA once it has considered the business case for such a move. The MRC has recently moved from grant-based funding to block grants through the Research Council UK (RCUK) allocation to institutions. The MRC has also adopted a position which expresses a preference for Gold OA.

Most of the charities we spoke to had an OA policy, although in one case this extends simply to paying article processing charges (APCs) when requested, without a general

Table 1 Funders interviewed

Sector	Funder
Public	Medical Research Council National Institute for Health Research
Charitable	The Wellcome Trust Cancer Research UK The British Heart Foundation Alzheimer's Research UK Arthritis Research UK The Association of Medical Research Charities
Commercial	AstraZeneca GlaxoSmithKline

Research Information Network, London, UK

Correspondence to

Ellen Collins;
ellen.collins@researchinfonet.org

requirement to make content available on an OA basis. Other policies ranged from the Wellcome Trust—well established, supported through block grants to institutions and with increasingly strict responses to non-compliance—to much less formal policies, which simply require a deposit into Europe PMC with no specifications about the licence terms and not always backed by funding. All funders with a policy had adopted a maximum 6-month embargo period.

The policy of both the commercial funders consisted in ‘not having a policy’. Both were very supportive of OA and happy to fund fees where they were requested, but they did not mandate OA publication of journal articles (although they did mandate open publication of some other kinds of material related to the trials that they funded).

A funder's OA policies are strongly influenced by their overall organisational aims and objectives

Several of the interviewees we spoke to explicitly linked their OA policy to their overall organisational objectives. All organisations that fund medical research have an ultimate aim of improving health, healthcare, patient outcomes or patients' lives. For some interviewees, funding medical research is the main way their organisation seeks to achieve these aims and OA tends to be relatively high on their agendas. They talked about publishing as a core element of the research process: to have value and impact, the results of the research must be available to readers within and outside the scientific community.

Other organisations have responsibilities or drivers which make their position on OA more complex. Many charities fund research as only one part of their activities: in some cases, a very small part, which sits alongside public communication and support for people living with medical conditions. These organisations have academic advisory committees whose members might have strong views about the desirability of OA. But the employees who are responsible for research often have to weigh up the value of OA publication against other types of public accessibility—lay summaries or patient information leaflets which use content from research articles were mentioned by several interviewees. Even an interviewee who believed strongly in OA felt it was unlikely that journal articles would have much value to a lay reader (though others disagreed, one interviewee suggested the media may play an important role). Interviewees from two charities suggested that the evidence is not yet available which connects OA with their corporate goals of curing disease or improving patients' lives: this can make it difficult to argue internally for OA.

Interviewees from industry were generally very supportive of the principle of OA and saw no conflict between this and their organisational aims. In both cases, interviewees stressed that external pressure tends to be greater around open data and other kinds of output than OA to journal articles: neither had a firm

organisational policy on OA and they did not anticipate this developing in the near future. In the context of general support for OA, one interviewee raised interesting concerns about off-label drug use. Promoting off-label drug use is a serious offence for pharmaceutical companies and advice from internal compliance and legal teams suggested that a company-funded OA publication could be perceived as advertising. The interviewee felt that this might be particularly relevant for articles in hybrid journals where the author decides to publish in OA after acceptance rather than before submission. The problem is one of perception: if it looks as though the company is trying to push off-label drug use through OA publication, they are exposing themselves to an unacceptable risk.

The way a funder gets its income affects its approach to OA; charities, in particular, have to be very mindful of justifying their expenditure and making the best use of their money to support several competing aims

Wellcome, a wealthy charity financed by an endowment rather than fundraising, can spend a considerable sum of money (although still less than 2% of its annual research costs) on supporting OA for all its researchers. Other charities find it harder to fund OA. Most of our interviewees from charities stressed that their work is funded by donations from the general public. The charity is answerable for the expenditure of this money in the most efficient way possible and—as discussed above—its staff do not always see OA as the best way of meeting organisational objectives. This can be particularly true for smaller charities, where a single APC might represent a relatively large proportion of the budget available for research. Charities are also acutely conscious of their overheads and of the way that high APC payments might look to potential donors. On the other hand, one interviewee from a charity felt that OA could support efforts to show donors the impact of the work they have funded.

Public funders are also subject to these questions about value for public money, but they have a very different perspective. Because their main organisational purpose is to fund research and because their funding comes from the public through government rather than individual donations, they are able to take a stronger line on access to research, particularly now that the Government has given firm support to the policy. Indeed, the primary driver for OA seems to be the principle of public access to publicly funded research, although recent developments have also emphasised access for businesses to drive commercial growth.

Commercial sector interviewees, although keen to stress that they are not a ‘bottomless pit’ for article processing charges, are happy to pay OA fees when requested by their researchers. As one interviewee put it, in the context of a multicentre study costing millions of dollars, \$3000 for an APC is not a problem.

The arrangements whereby researchers may request and receive funding for OA fees vary across funders

All the interviewees we spoke to were prepared to consider funding Gold OA fees if requested by their researchers, but some would only offer funding in certain circumstances. For example, Cancer Research UK (CRUK) will only fund articles out of an underspend from specific grants, while the British Heart Foundation (BHF) will fund research articles but not review ones, on the basis that only the former contains the new knowledge which may advance medical science. The Wellcome Trust and MRC are the only two funders to make block grants available to institutions: for the MRC, this began in April 2013 as part of the RCUK allocation. Most other funders either operate a central fund to which researchers can apply, or allow researchers to include publication costs within their grant applications, or both.

The funders with a central 'pot' for OA organise it on a scale which ranges from relatively formal to completely ad hoc. One interviewee from a charity explained that they run a separate fund for OA fees because publications arising from a project usually occur after the grant is closed—reopening it to pay for APCs would be an administrative nightmare. Other funders pay APCs out of a general publication fund, classifying them with page and colour charges and medical writers' fees, where these are used.

Another group of funders did not maintain any central funding for OA, meaning that researchers usually needed to include these costs in their initial project budgets: these may be wrapped up with other publication charges that a researcher might expect to incur. Once again, funder systems ranged from very informal—accepting APCs within a budget if the researcher proposed them but not actively suggesting them (a practice employed by both of the commercial funders we spoke to as well as one of the charities)—to much more formal—specifically asking grant applicants whether they had included funding for OA and ensuring that they did so, which is the NIHR's policy. The MRC suggested that in their experience asking researchers to include APCs within grant applications had not led to high levels of compliance with the OA policy, although the NIHR has had a more positive experience with this technique.

Compliance rates vary enormously: funders would like to see these rates increase and believe publishers could help by supplying better information to researchers. Most funders are finding it difficult to monitor compliance

Most interviewees named the Wellcome Trust as an example of a funder with high compliance rates, although in fact their compliance is probably lower than the 98% achieved by the NIHR under the Health Technology Assessment (HTA) Programme. But most monitoring by charities showed relatively low levels of compliance among their funded researchers: in some

cases, as low as 20%. Interviewees put this down to a combination of factors, including the fact that they do not always employ strong sanctions in seeking to enforce their OA policies (see below).

Funders are keen to improve compliance; one important route to achieve this (they believe) is to improve the information researchers receive when submitting their article to a journal; some, but not all, were aware of the services offered through Sherpa. Some of the larger funders we interviewed wanted publishers to ensure that researchers were only offered publishing options (licence types, embargo periods) which were compliant with their funding source. But smaller organisations, perhaps recognising that journals are unlikely to maintain a complete list of all research funders, expressed a preference for a clear explanation of licence and publication options which a researcher could, on their own, reconcile with their funder's stated policy. They did not want to create a situation where researchers were presented with unfamiliar options (especially around Creative Commons licences) and asked their funders for clarification: many funders do not have the capacity to deal with such enquiries.

Monitoring OA compliance is difficult. An interviewee from one of the larger charities said that doing so effectively amounted to a full-time job. Few charities have the capacity to monitor compliance in a systematic way, particularly since they may have to use several systems in order to get a comprehensive picture. Interviewees mentioned ResearchFish, PubMed Central, Europe PubMed Central and Web of Science as ways to monitor compliance; in most cases, this is performed through manual checking on a regular or semiregular basis. But these systems do not always offer a complete picture: even the Wellcome Trust found discrepancies between the number of research outputs listed on end-of-grant reports and the data they generate through monthly checks of PubMed and PMC. The NIHR recently launched a Journals Library, which will help them to monitor their own publications but they—like the MRC and Wellcome Trust—do not see it as their role to monitor compliance on behalf of other funders.

Some funders suggested that regular data from publishers would help improve compliance rates. But others felt that this would not resolve the core difficulty of too much information coming from too many different sources: a midsize charity mentioned that their funded researchers publish in over a hundred journals. Most agreed that a formal system for acknowledging funders and grant numbers would be extremely helpful—some were aware of and mentioned FundRef in this context—but interviewees believed this might be difficult to implement as a single grant number can be expressed in many different ways. An interviewee from a large charity also mentioned the need to distinguish between types of research funding: direct project grants, support for individual researchers and support for research centres. The Association of Medical Research Charities (AMRC)



interviewee picked up on this, acknowledging that the lead researcher on a project may not think about all the different kinds of funding that have made contributions to the final output.

At present, funder sanctions for non-compliance are not usually strong and they believe it is more important to encourage researchers to comply than to punish them when they do not

Enforcement and sanctions for non-compliance vary. Funders recognise that they must allow policies to bed in and become part of researcher culture before they undertake strict enforcement. Most charitable funders are aware of the Wellcome Trust's strict policy on compliance, and the enforcement of that policy, but none envisage implementing such a strict policy in the immediate future. Almost everybody we spoke to expressed sympathy for their funded researchers, recognising that the environment is changing rapidly around them and that it might be counterproductive to apply sanctions until policies are well understood and embraced by the scholarly community. One interviewee talked about 'positive reinforcement' and encouragement for researchers who do comply, rather than sanctions for those who do not. Several interviewees were keen to see how the Wellcome Trust's stronger enforcement fared before deciding whether to pursue a similar policy themselves. Some charities were also concerned that stricter monitoring and sanctions might lead to more requests for funding from their researchers and, for the reasons outlined above, this would cause them problems.

Research funders across the board are worried about the escalating costs as Gold OA becomes more mainstream, and they are not certain that they will be able to accommodate them. Many—particularly the charities—see Green as an essential element of their overall OA strategy

The Government's firm preference for Gold was recognised by most of our interviewees from the public and charitable sectors. Most expect OA to become more mainstream among their researchers—several specifically mentioned the Higher Education Funding Council for England's (HEFCE's) position on Research Excellence Framework (REF) 2020 as being particularly important in changing researcher attitudes. As a consequence, they are all anticipating an increase in the number of applications from researchers for APCs in the next 12–18 months: this is of particular concern to those who currently have very low rates of requests. Even the larger research funders with well-established policies said that their current assumptions are based upon estimates of article volumes and APC levels; they are worried that costs could end up much higher than originally thought; this will depend on how the APC market develops.

Many of the charitable funders we spoke to said that their OA policy was predicated on an assumption that most OA would be achieved through the Green rather

than the Gold route. One interviewee told us that funding for Gold was introduced as a kind of last resort, to ensure that researchers could publish in their preferred journal even if it refused to offer a 6-month embargo period, and stressed that APCs may in some cases cost more than their smaller awards for travel or conference attendance. Even some of the larger funders were concerned that increased pressure on their budgets might be unsustainable, particularly those who do not currently pay Gold OA charges routinely, although others were more sanguine. One interviewee expressed concern that publishers may cease to offer the Green option to researchers, if Gold becomes the prevailing business model for OA publishing.

Funders recognise that they operate in a developing national and international system, and that they have a role to play in influencing this system. Nonetheless, many charities and commercial funders do not anticipate moving as far or as fast as the MRC and the Wellcome Trust, widely acknowledged as leaders. They realise that this may cause complications for researchers funded from a number of sources and most are prepared to be flexible with their payment policies

The MRC and the Wellcome Trust are widely seen by medical research charities as having the strongest policies and enforcement and taking a lead on OA not just nationally but globally. Interviewees from both funders recognised this role. They talked about supporting culture change within institutions (at the national level), and also leading a conversation with international, especially European, funders, to encourage them to follow the UK's lead on OA. Europe PMC is an important focus of these discussions. Some of the UK's research charities had been involved in this work, and had implemented policies at a similar stage to the Wellcome Trust, and there is further alignment and discussion through the Office for Strategic Coordination for Health Research. The Wellcome Trust is happy to take a leadership role in OA development, recognising that it has staff time and organisational buy-in that other charities do not. But it would be unwilling to bear all of the costs or take all of the decisions alone: it is important to be part of a wider movement.

But interviewees from most of the charities did not feel they are ready to move as far or as fast as these two funders. Some were concerned that medical charities were not represented on the Finch group, and so were playing 'catch-up' in understanding how to translate the group's conversations and findings to their own funding systems. Many interviewees perceived the Wellcome Trust and the MRC as relatively wealthy and independent and hence able to move faster than smaller charities. Most research charities mentioned the AMRC as an important location of advice and support, and some said that they were waiting for the AMRC to develop their guidance (work which was underway at the time of the interviews) before deciding on their own next steps. The

AMRC itself recognises this role, and stressed the difficulties faced by smaller charities which cannot afford to dedicate a full-time post to publications or scholarly communications.

Many interviewees recognised that this places their researchers in a rather difficult position. As one said, 'it would be easier for grant holders if all medical research charities had the same policy'; the MRC said that its original move towards OA was prompted by a recognition that 20% of researchers citing the Wellcome Trust as a funder were also citing the MRC. Most of the interviewees were happy to pay in cases where research was jointly funded, assuming that it will all balance out in the end. The BHF had the clearest position on joint funding; it will pay the whole APC if it is the only funder with a strong OA agenda, but otherwise it would generally expect it to be split (although in practice this tends to be interpreted quite generously). The interviewee added that this is a very labour-intensive process, and subsequently the BHF has relaxed the policy, and will normally pay the whole of the APC for a research paper reporting jointly-funded work if the author requests it.

CC BY is very important to the Wellcome Trust and the MRC: some charities see its value and importance, but smaller ones are worried about the implications of mandating it for their researchers

The principle of reuse was extremely important to the Wellcome Trust and MRC interviewees, and central to their conception of OA; this is reflected in their policies that, as of 1 April 2013, they will only fund APCs if the work is published with a CC BY licence. Other funders with OA policies did not yet have strong views about CC licences. Some anticipated that they would harmonise their policies with those of the MRC and Wellcome Trust. Others—particularly smaller charities—felt that this is an area where it is difficult to get ahead of researcher behaviour; they do not have the resources to educate researchers about CC BY and its value. And they do not want to put their researchers in the middle of a conflict between their publishers and funders—so, while they may support the principle, they are not likely to implement CC BY as a requirement in the near future.

IMPLEMENTATION

Funders are very clear that decisions about where to publish should be taken by individual researchers and that they must not appear to interfere with this; but most public and charitable funders said that they hoped or expected APC costs to become a factor in these decisions

All our interviewees, from public, private and charitable funders, were very clear that researchers should always be responsible for taking decisions about where they publish their research. They know the most suitable outlets for their work, and funders do not wish to interfere with that knowledge. One interviewee from a commercial funder said that as OA journals achieved higher

impact factors, they became a more desirable outlet for researchers, and that this was probably more important than researchers' beliefs or ideology in driving the growth of OA publishing. The interviewee from the MRC said that *PLoS ONE* is now the top journal for publications by their researchers and wondered whether the traditionally high-impact journals would still be as important in 10 or 15 years.

Nonetheless, many funders did expect that their moves towards OA would become a factor in the researcher's decision-making process and were keen to see that happen. One interviewee from the Wellcome Trust talked about how authors are currently 'insulated' from the costs of publishing, since negotiations are carried out at a national level by Jisc Collections. In his view—which was echoed by an interviewee from a charity—increased author awareness of publishing costs is a desirable outcome of the move towards OA. The MRC interviewee also talked about cost as an increasingly important factor in decision-making, alongside journal impact. Although there is a small group of high-impact journals which researchers are unlikely to turn down on the basis of cost, the interviewee believes that cost will become more of a factor when choosing between less prestigious outlets.

Interviewees from some medical research charities adopted a similar position, although they stressed that this was a personal rather than an organisational view. Interviewees from organisations which were not routinely paying many APCs had given less thought to this issue, but they all emphasised the importance of researcher autonomy over where to publish.

Funders expect to see a market develop in APCs and are keen to secure the data that will help this to happen, but they do not think that it will always be easy to do so

Most funders expect that stricter policies (including a possible position from HEFCE) and increased availability of APC funding will lead to Gold OA becoming a more common publishing route. In turn, they expect that this will lead to a more competitive market for APCs. But some funders were concerned that this market may not develop on its own, and believed that consistent data about APC costs will be difficult to acquire. The Wellcome Trust already collects these data where it can, but not many other funders do.

An interviewee from the Wellcome Trust expressed concern that new business models such as memberships might make it difficult to identify the real costs of APCs, meaning that it is hard to tell whether the market is operating efficiently. Another interviewee was already engaging with publishers to discuss OA costs, while a third interviewee was considering the long-term possibility of capping the level of APC that their organisation is prepared to pay (this is not currently organisational policy). In their view, funders have a limited number of mechanisms to support effective operation of the APC system and this is one that should be considered.

Funders recognise that business models are still evolving and, at this stage, are keen to encourage experimentation by leaving decisions to institutions or authors. But they do have concerns about some of the new models offered by publishers

Some of the funders we spoke to recognised that publishers, like researchers, need time to adapt to OA publishing, and most accepted that publishers will want new business models to be profitable. All were keen to see innovation and, in general, did not feel that they were ready to take a strong view on specific business models, preferring to allow institutions or authors to make decisions about the best way to achieve OA—as one interviewee said, ‘not much is ruled out’. In time, and once they have seen how new business models evolve, they might implement stricter policies.

Individual funders with experience of OA expressed concern about some of the business models currently offered by publishers. Interviewees at the Wellcome Trust were concerned that memberships or prepayment accounts could mean that large amounts of money are tied up with traditional publishers, leaving little to support new market entrants or innovators as well as obscuring individual APC costs as mentioned above. This would recreate the problems of subscription publishing, and may also restrict researcher choice if institutions encourage publication with certain journals to use up prepaid accounts. But the MRC interviewee was less concerned, stressing, again, that what a researcher publishes is more important than where they publish it. The MRC interviewee was also concerned about paying for anything that would not speed up access to new research, specifically mentioning payments to retrospectively ‘open up’ content that was published before the RCUK mandate came into effect.

Mega journals such as *PLoS ONE* (mentioned by several interviewees) are seen as an interesting development. They provide an important platform for negative or lower impact findings which should nonetheless be published: this was especially important for commercial research funders who have committed to publishing results of all their trials. But some funders were cautious about emphasising the value of such journals for ‘less important’ work, feeling that this could discourage a more general move towards OA. They want to avoid perceptions of a two-tier system, where the business model which supports a journal article (OA or subscription) is seen to reflect its academic significance.

Support for infrastructure, particularly Europe PMC, was high among our interviewees, but in the longer term they will be asking questions about who should pay for such services. New infrastructure services such as Open Access Key (OAK) were less familiar but funders were happy to explore them

Most organisations with well-established OA policies were also funders of Europe PMC and recognised its value to their researchers as a single source for medical

research publications. Several mentioned their concern that the HEFCE consultation mentions institutional repositories but not subject ones, and stressed that they would see institutional repositories as an addition to, rather than a replacement for, Europe PMC. Their preference would be for publishers to permit archiving in both types of repository; one suggested that currently this is not allowed by many publishers.

There appears to be some difference of opinion over the appropriate scope of Europe PMC. While many funders recognised that its functionality—linking, reporting, citation data, text mining—is of value to researchers, others felt that it was straying from its core activity as a repository for content. They felt that this would need to be reviewed in the near future, and that it might be necessary to separate out the repository function from the broader programme of research around the service.

OAK and other new services to support the implementation of OA were not familiar to most funders, but they were interested in learning more. Interviewees who had heard of these types of service recognised their need to make a profit through the work that they do.

APC-based OA shifts the costs of publishing from institutions to funders: for charities in particular, this is a concern as historically they have not paid overheads on their grants

All interviewees agreed that publishing is a core element of the research process. But this is a cost that has historically been met through the overheads on a research grant, which include some provision to meet part of the costs of library subscriptions (the rest being met through QR funding paid directly to the institution). Historically, charities have not paid overheads on their research grants; these have been paid by the Charity Research Support Fund. But because APCs are seen as a direct cost of research, they will not be covered in overheads, but must rather be paid directly by the research funder as part of their grant.

Almost all of the charitable funders we spoke to emphasised that, as a result of these arrangements, APCs represent an entirely new cost within their budgets. The savings that libraries expect to see as a result of the reduction in subscriptions will not be passed back to the charitable funders, as they do not currently play any part in meeting those costs. As a result, they will need to find additional funds within their research budgets to meet the costs of APCs. Most are very concerned about this.

Many funders who pay APCs directly to publishers find the process cumbersome and some would be interested in options which would streamline this

Several funders pay APCs directly to publishers rather than channelling payment through their researchers. The request for payment sometimes comes through a researcher, but more often than not the funder simply

receives an unexpected invoice from a publisher. Paying these can be very time-consuming, particularly in cases where the publisher has not provided enough information about the researcher or their article for the funder to identify the relevant grant. Furthermore, publishers do not always split the OA fee from other costs, such as page or colour charges, which makes it difficult for funders who will pay the former but not the latter.

OAK and other intermediaries were seen as a possible solution to this problem, as were prepay publication funds lodged with individual publishers.

OTHER FUNDER PRIORITIES

Many funders consider negative findings a major priority, and believe that OA journals offer a good publication route for results which may not pass the 'significance' test of peer review in more traditional publishing models

Most funders we spoke to are keen to ensure greater availability of negative findings. The AMRC interviewee believed that this is a more pressing issue than OA for most members, while stressing that they need to clarify exactly what they mean by negative findings: experiments that failed or those which found negative results. The CRUK interviewee also mentioned the need to publicly record the experiences of researchers on trials which were terminated, usually due to difficulties in recruiting patients. As another interviewee from a charity said, seeing how other people have failed is very important to scientific progress.

The general perception was that, although journal editors may support publication of negative results, they rarely want to publish them in their own journal. An interviewee from industry was particularly keen to stress this: his company has made a commitment to publish all their findings, positive or negative, but found that it could be difficult to place certain articles. Another interviewee suggested that negative results could be published in a non-article format, perhaps allowing more reflection on why a trial or study did not work. Most interviewees mentioned that OA megajournals could be a good outlet for negative results, which may meet tests of scholarly quality but not of significance in more traditional publication outlets.

Publishing data and other kinds of output are very important to funders, although complicated

Data are a major issue for most of the funders we spoke to, particularly the commercial funders. Interviewees from the Wellcome Trust expect that data will be an important focus for their work in the next 12–18 months. They, along with many other funders, have a policy on data sharing which requires researchers to explain how they will make their data available to interested parties, but this is generally seen as unsatisfactory for the longer term.

Sharing data is complex. Patient confidentiality was mentioned by several interviewees: ensuring that only

people with a legitimate interest in the data have the ability to see it. GlaxoSmithKline have invested in a platform for research data which allow researchers access once their proposals for reuse have passed an independent screening panel: a public sector interviewee described this kind of vetting process as allowing 'safe data, open by design'. In other words, the presumption is that data will be protected, but the access design will be open to allow researchers with a valid research and analysis plan to reuse the data. The interviewee added that such reuse should require the researcher to place the research plan and the results of the new research into the public domain.

Other barriers include the funding and skills needed to make data truly reusable. Several interviewees mentioned a lack of standardisation and the consequent need for researchers to spend considerable time and effort to explain exactly what the data mean and how they were collected. One interviewee mentioned peer review for data. Where complexity was identified as a challenge, interviewees usually also mentioned that not all data would be valuable for reuse, and suggested that they would want to prioritise the content that researchers would actually want to see, although it is not clear how this prioritisation would be carried out. Not all interviewees were convinced that publishers should become heavily involved in research data.

Several interviewees went beyond data to talk about 'open science' more generally. This includes protocols, reagents, study reports and other types of output which could be useful to other researchers. The AMRC interviewee stressed the importance of publishing content that is not linked to clinical trials—preclinical trials and non-drug interventions such as psychosocial or device-based studies; these are not currently covered by the registry of clinical trials and thus often not in the public domain. An interviewee from a commercial sector funder was very keen to publish protocols and study reports, and wanted publishers to help link them back to journal articles which are based on this material.

Evidence of the impact of OA would be extremely valuable to funders; altmetrics or article-level metrics may help to supply this

Many funders are keen to capture the impact of OA as it becomes a more common way of sharing research findings. Most of the charitable funders we spoke to—even those with well-established and long-standing OA policies—still need to convince others within their organisation about the value of OA, particularly relative to other activities such as patient information and support. Evidence of the benefits of OA to research, and to society more generally, will be very important to making this case, but such evidence is currently extremely hard to capture because use is so widely distributed. Altmetrics and open citations were mentioned by the Wellcome Trust as useful developments which could help to collect this information, and interviewees hoped

that publishers would support these innovations. The press team at CRUK use altmetrics to help them identify good stories for newsletters, and the Wellcome Trust uses OA material in its newsletters.

Other priorities for publishers to bear in mind

Individual interviewees mentioned some other concerns which they hoped publishers would engage with over the next 12–18 months. These included a facility for discussing articles online postpublication; supporting and encouraging authors to supply high-quality lay summaries alongside their articles; working collaboratively to develop a more universal system of recording and tracking author disclosures of conflict of interest; and working to develop more nuanced records of article contributorship (as distinct from authorship).

ROLE OF PUBLISHERS IN IMPLEMENTING OA

Publishers are seen as having a mixed role in the implementation of OA, with some actively pushing the agenda forward and others resisting it

Most funders divided publishers into at least two groups: those who are actively engaging with OA and those who are either resisting it or who are simply using it as an opportunity to increase their revenues. OA publishers like BioMed Central (BMC) or Public Library of Science (PLOS) are widely seen as pushing the agenda forward—in the words of one interviewee, ‘changing the way we think about publishing’. Some more traditional publishers are also seen as engaging enthusiastically with OA, in spirit as well as action—BMJ was widely seen as falling into this category.

But most traditional publishers were seen, at best, as reluctant to move away from a business model which has served them well for so long. Interviewees, particularly

in the commercial sector, expressed sympathy for publishers, but most also felt that they needed to adapt to changing realities in a way which was fair and perhaps even recognise the opportunity to explain how they add value to the publishing process. The issue of peer review came up in many cases; the OA debate seems to re-ignite concerns about publisher value-add being based on free academic labour. In the most negative light, some publishers were seen as actively resisting OA—one interviewee suggested that this was clear from the language they use when describing OA services and options to their authors.

In general, although some interviewees expressed an interest in moving away from the traditional publishing model to a more open online environment, most found it difficult to see how this could happen. They acknowledged that researchers are extremely attached to the existing journal model of publishing, and particularly the journal brand, and some interviewees clearly felt the same way. One said that journals would always be important, allowing researchers to identify what is relevant and significant in a way that, for example, Europe PMC never could.

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