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Publisher embargoes and institutional repositories: a case study of journal articles subject to an Australian funder mandate.

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Introduction. Despite funder policies recognising the repository route as critical to achieving open access compliance, most accepted manuscripts in repositories have embargoes on access. This paper explored the extent to which embargoes hinder open access for grant recipients.
Method. The study applied bibliometric research methods to analyse 7,562 journal articles, published in 2019 and funded by Australia's National Health and Medical Research Council. The primary data sources included Web of Science, Google Scholar, and Sherpa Romeo.
Analysis. Analysis was performed for the embargo periods of accepted manuscripts of non-open access articles (43.76%, n = 3,309) in institutional repositories and the effects of embargoes on compliance with funder policies.
Results. Three-quarters of non-open access articles had embargo periods of twelve months. However, 30.94% of total articles remained publicly inaccessible, with accepted manuscripts in institutional repositories comprising only 9.65%.
Conclusions. Publishers' embargo periods complicate the cost-free solution of depositing accepted manuscripts in institutional repositories. The promotion of zero-embargoed journals and the adoption of zero-embargoes for funded articles in institutional repositories through funder-publisher agreements would achieve higher open access levels and compliance with the Council's Policy.

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Introduction

During the COVID-19 pandemic, publishers lifted embargoes on medical and public health research, demonstrating the value and benefit of immediate access to share knowledge (Devasahayam, 2020; Tavernier, 2020). However, these were unusual times. Usually, authors face several overlapping options to comply with grant funder open access mandates. The publishing options include paying article processing charges to publish in fully open access or hybrid subscription journals or submitting to a journal with gratis or delayed free access but no open licences. The other valid route to achieve scholarly open access is to deposit an article's accepted manuscript in a repository. These are the different options available to authors of

articles funded by grants from Australia's leading medical research funder, the National Health and Medical Research Council (2018). This paper continues earlier work into compliance with the Council's Open Access Policy by grant recipients (Kirkman, 2018; Kirkman and Haddow, 2020).

An accepted manuscript is the peer-reviewed version of a journal article accepted for publication with the same content as the published article but without final formatting and copy-editing. For authors who do not publish articles open access, the deposit of accepted manuscripts in repositories is one of the principal routes to achieving open access compliance. Known as green open access, the repository route is a critical component of funder open access policies. But embargoes placed on accepted manuscripts in repositories, some up to four years, lead to lags in access and affect compliance with funder mandates. Against the backdrop of growing advocacy for immediate open access and zero-embargoes, this study aimed to identify relationships between embargoes and accepted manuscripts in repositories and compliance with funder open access mandates. The study did so by examining articles funded by the Council and mandated under its Open Access Policy to be open access within twelve months of publication.

Definitions

In this paper, scholarly open access is defined as free and unrestricted online availability and immediate access preferably under open licensing such as Creative Common Attribution licences (Berlin Declaration, 2003; Bethesda Statement, 2003; Budapest Open Access Initiative, 2002; Max Planck Society, 2013; Velterop, 2005; Papillon et al., 2019; Schiltz, 2018). The open access policies referred to are those adopted by research funders, research organisations and universities that require their grant recipients to make their research publications open access.

Several types of articles and journal models are referred to in the paper and the definitions used by the authors are:

- Fully open access journals are those listed in the Directory of Open Access Journals and comply with the definition of open access of the Budapest Open Access Initiative;
- Gratis open access journals provide open access, usually without a Creative Commons Attribution licence;
- Delayed access articles are open access after the expiry of publishers' embargo periods;
- Hybrid subscription journals provide open access upon payment of article processing charges, with the remainder of the content being non-open access and only available to subscribers;
- Subscription-only journals have no hybrid open access option. The articles published in these journals are only available to subscribers or as accepted manuscripts in institutional repositories. Non-open access journal articles are not publicly accessible and only available to subscribers. These journals do not offer a hybrid open access option. The deposit of accepted manuscripts in institutional repositories offers authors of non-open access articles a route to achieve open access.
- Transformative journals are a feature of Plan S and the term indicates that a journal has agreed to transition to fully open access (https://www.coalition-s.org/transformative-journals-faq/).

Background

Open licensing is a crucial feature of fully open access journals listed in the Directory of Open Access Journals. Publishers of journals financed by subscriptions also provide immediate open access with open licensing known as hybrid open access. They do this by imposing article processing charges on authors wishing to make their article open access. However, this practice has been widely criticised as double-dipping (Kingsley, 2014a; Pinfield et al., 2016). The increase in article processing charges is also a concern, especially for authors without funding to cover the cost (Ellingson et al., 2021; Khoo, 2019).

Another model for open access is delayed or bronze open access journals. These provide access to final published articles after publisher embargoes which impose a time delay on the published or accepted version of a publication before it can made publicly available. The model is commonly used by society publishers and some commercial publishers such as Elsevier and Cell Press through their open archive programs (Ellison et al., 2019; Martín-Martín et al., 2018). However, considerable criticism surrounds publishers' use of embargoes that protect subscription incomes because it infringes the rights of authors to archive their own

work (Gadd and Covey, 2019; Gadd et al., 2018; Kingsley, 2014b; Pinfield et al., 2017; Piwowar et al., 2019, 2018; Tennant et al., 2019).

Increasing subscription costs challenge the ability of academic libraries to provide adequate resources in all disciplines. Libraries have become persuasive advocates for green or repository open access as a cost-effective solution for authors and a response to the sharply increasing cost of subscriptions. The Ligue des Bibliothèques Européennes de Recherche (LIBER) (2021a, 2021b), representing the university, national and special library sectors across Europe, proposed a no embargo or immediate republication model for open access versions of public-funded articles deposited in repositories. In Australia, the Council of Australian University Librarians (CAUL), Universities Australia, and the Australasian Open Access Strategy Group support the Findable, Accessible, Interoperable and Reusable (FAIR) principles (Council of Australian..., 2019; FAIR Steering Group, 2017).

The timing of deposit and the length of embargoes affect the accessibility of open access versions in repositories. The primary form of repository of interest in this research is the institutional repository, which is an online and publicly accessible repository hosted by an institution that stores and preserves the metadata for and open access versions of scholarly publications and research data produced at that institution.

Although the Research Excellence Framework 2021 in the United Kingdom requires the deposit of manuscripts in institutional repositories at the time of acceptance by the publisher, embargoes on access vary from twelve months in the science, technology, engineering, and medicine disciplines to twenty-four months for the arts, humanities, and social sciences (Herrmannova et al., 2019; Fraser et al., 2018). The United States National Institutes of Health Public Access Policy (US. Dept Health and Human Services, 2008) adopted a middle ground of twelve months after publication as the standard embargo for National Institutes of Health-funded manuscripts in PubMed Central (Hampson, 2019). Australia's two major research funders, the Australian Research Council (2017) and the National Health and Medical Research Council's (2018) policies allow twelve months for compliance with their open access policies.

Plan S is an initiative launched by cOAlition S, a consortium of national research agencies and funders from European countries. From the beginning of 2021, Plan S requires the publication of public-funded scientific research in fully open access journals and platforms or made immediately available in repositories (cOAlition S, 2019b). Delayed access is incompatible with immediate open access, and cOAlition S funders do not support the double-dipping practices of some journal publishers, including the hybrid open access publishing model (cOAlition S, 2019a, 2019c). Where publishing in fully open access journals is unachievable, Plan S requires the deposit of accepted manuscripts or versions of record (the final published version of an article) in repositories with no embargo and accompanied by Creative Commons Attribution licences.

However, only a few publishers have zero-embargo policies on access to accepted manuscripts in institutional repositories (Flanagan et al., 2020). Some publishers fear that zero-embargoes may lead to journal cancellations, although studies have found that accepted manuscripts in repositories do not harm journal publishing (Berners-Lee et al., 2005; Gadd and Covey, 2019; Kingsley, 2014b; Peterson et al., 2019; Pinfield et al., 2017; Tennant et al., 2019). In addition, the different durations of embargoes cause technical issues for institutional repository staff (Khoo and Lay, 2018; Ten Holter, 2020). Creative Commons licensing is rare among gratis and partial open access journals (Piwowar et al., 2018, 2019) and publishers with zero-embargo policies (Taylor, 2020).

Embargoes and publishers' conditions are among the known issues contributing to authors' low engagement with depositing accepted manuscripts in institutional repositories (Bakker et al., 2017; Björk et al., 2014; Borrego, 2016, 2017; Henty, 2014; Huggard et al., 2017; Kirkman, 2018; Kirkman and Haddow, 2020; Nicholas et al., 2017; Poynder, 2017; Seaman, 2017; Zhu, 2017). Khoo and Lay (2018) established that long embargoes are a deterrent to compliance with funder open access policies. Nevertheless, the pressure to comply with funder and institutional mandates has been the cause of tensions in some institutions between repository staff and researchers (Henty, 2014; Huggard et al., 2017; Fraser et al., 2018; Ten Holter, 2020). In addition, although library and repository staff have copyright and licensing expertise, Baldwin and Pinfield (2018) identified publishers' embargoes as inhibiting access to accepted manuscripts in institutional repositories. Adequate resourcing of repositories is necessary for embargo management (Borchert et al., 2019). While some researchers prefer to self-archive in scholarly collaboration networks, such as

ResearchGate, embargoes and copyright also apply to accepted manuscripts on these sites (Björk, 2017; Borrego, 2017; Laakso and Lindman, 2016).

Previous research into embargoes on accepted manuscripts in institutional repositories considered the effect of lengthy embargo periods on access and compliance with funder policies (Baldwin and Pinfield, 2018; Huang et al., 2020; Khoo and Lay, 2018; Kirkman, 2018; Kirkman and Haddow, 2020; Sutton, 2013). Other investigations explored the embargo periods for versions of record in delayed open access journals but not the embargoes on accepted manuscripts in institutional repositories (Kirkman, 2018; Kirkman and Haddow, 2020; Piwowar et al., 2019), and Taylor, 2020) provided data on zero-embargo policies of subscription journals.

Many publishers of subscription-only and hybrid subscription journals impose embargoes on accepted manuscripts deposited in institutional repositories: ranging from a few months to four years. The effects of these embargoes on deposit in institutional repositories were the primary focus of this research.

Method

The population for the study comprised articles funded by Australia's National Health and Medical Research Council (the Council) and published in 2019. The first part of the research focussed on the embargo periods for the accepted manuscripts of a set of non-open access articles and whether these embargoes affected the extent of authors' self-archiving in institutional repositories. The second part of the study explored the compliance timeframes of the Council's Open Access Policy and Plan S.

The research questions were:

1. How many articles were immediate open access, delayed open access, and non-open access?
2. What were the embargo periods for non-open access articles?
3. How many accepted manuscripts of non-open access articles were deposited in institutional repositories and what were their embargo periods?
4. How did embargoes on accepted manuscripts in institutional repositories affect compliance with the Council's Open Access Policy?
5. To what degree did Council-funded articles reflect the Plan S principles of immediate open access and zero-embargoed accepted manuscripts?

The study used bibliometric research methods to gather data about the population of articles. Searches in the Web of Science identified all Council-funded articles published in 2019. Sources of data on the open access status of journal articles included the Directory of Open Access Journals, Google Scholar, and Unpaywall. In addition, Sherpa Romeo, and publishers' Websites provided information on the embargo periods on accepted manuscripts deposited in institutional repositories. The first phase of quantitative data analysis generated descriptive statistics; the second phase involved graphical presentations.

Data collection

The search strategy followed an approach used in previous research which combined the funding acknowledgement and publication year fields in Web of Science to identify Council-funded articles published in 2019 (Kirkman, 2018; Kirkman and Haddow, 2020). The search output included the bibliographic details, the grant acknowledgements, and the Web of Science open access indicator. The results were downloaded to Microsoft Excel and formed the master spreadsheet. Data cleansing involved removing duplicates, non-journal publications, and articles in which the only reference was to the Council's research ethics codes.

Searches of Google Scholar and Unpaywall identified accepted manuscripts in Australian and overseas institutional repositories, as well as those in PubMed Central (the recognised subject repository of the Council's Open Access Policy). Sherpa Romeo was the primary source for identifying journal embargo periods. This source includes information about different pathways for the deposit of accepted manuscripts, which specify embargo periods and conditions. The general pathway was the most applicable for identifying the embargo periods for accepted manuscripts deposited in institutional repositories under the Council's

Open Access Policy. It is notable that alternative pathways, which are the result of agreements between funders and publishers, can mean that articles in the same journal are subject to different embargo periods. The cOAlition S Website was the source of data on Plan S principles, policies on embargoes, and a list of transformative journal titles.

There were three data collection periods, May-June 2020 and November-December 2020, and a final search in January 2021. The chief reason for the spacing of the search periods was to identify when and how institutional repositories recorded embargoed content. The timing also enabled the checking for open access compliance with the Council's timeframe of twelve months. The master spreadsheet of journal articles became the principal data management tool, with additional columns added for each required element. The codes used in the data coding sheet represented embargo periods of zero (zero-embargo), six, twelve, eighteen, twenty-four, thirty-six and forty-eight months, Not permitted, and Unspecified (for those journals without specific embargo policies for accepted manuscripts in institutional repositories).

Data analysis

Functions within Excel facilitated data analysis, with descriptive statistics, such as simple counts and percentages, generating results for the research questions. The initial part of the analysis identified the journal models through which Council-funded articles were published. Next, the analysis focussed on non-open access articles and the publisher embargoes on the deposit of accepted manuscripts in institutional repositories. Open access compliance under the Council's Open Access Policy was also the subject of analysis, as was the degree to which Council-funded articles reflected Plan S principles, especially immediate open access and zero-embargoed accepted manuscripts in institutional repositories.

Results

The proportions of articles that were immediate open access, delayed open access, and non-open access

Research question 1 asked, How many articles were immediate open access, delayed open access, and non-open access? The total number of Council-funded articles published in 2019 was 7,562. Of these, 3,258 (43.08%) were immediately open access and included articles in fully open access and gratis open access journals, and hybrid open access and immediate free access articles in subscription journals. A smaller percentage of articles (13.16%, n=995) was found for delayed open access journals. These journals impose embargoes on open access and most were the hybrid subscription model. At 3,309 (43.76%), non-open access articles comprised the (marginally) highest proportion of articles. The majority of these (3,227, 42.67%), were published in hybrid subscription journals, with only 82 articles (1.08%) published in subscription-only journals. This means the authors of 42.67% of the 2019 publications chose not to pay an article processing charge to make their work open access. Figure 1 presents the proportions of articles that were immediately open access (43.08%), delayed open access (13.16%) and non-open access (43.76%) in the set of 2019 Council-funded articles.

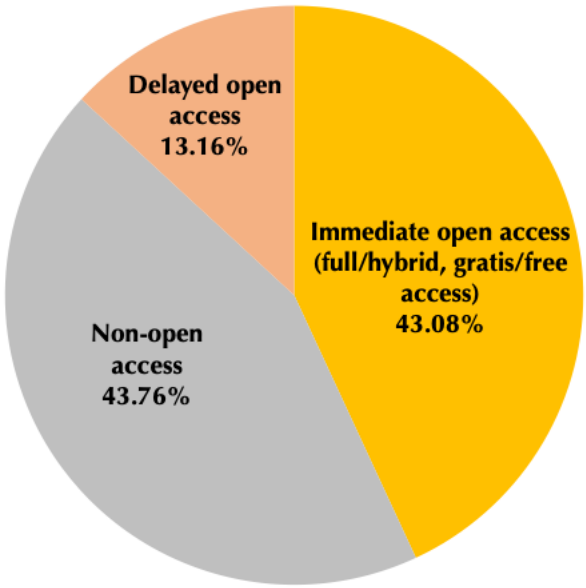

Figure 1: Extent of immediate and delayed open access and non-open access articles of Council-funded articles published in 2019 (n = 7,562)

Embargo periods for accepted manuscripts of non-open access articles if deposited in institutional repositories

Non-open access articles in subscription-only and hybrid subscription journals made up 43.76% (3,309) of the 2019 article set. For these articles, the repository route is the primary avenue for achieving open accessibility and the embargo periods for these articles were identified. Figure 2 presents the findings for the embargo periods imposed on accepted manuscripts for these non-open access articles. The percentage for each category of embargo period is expressed as a proportion of the total number of non-open access articles (3,309). Over 90% of non-open access articles had embargo periods of twelve months on accepted manuscripts in institutional repositories. While a considerable proportion of articles were published in journals with zero-embargo policies (8.34% non-open access; 3.65% of the total population), only a minuscule number had Creative Commons Attribution licences.

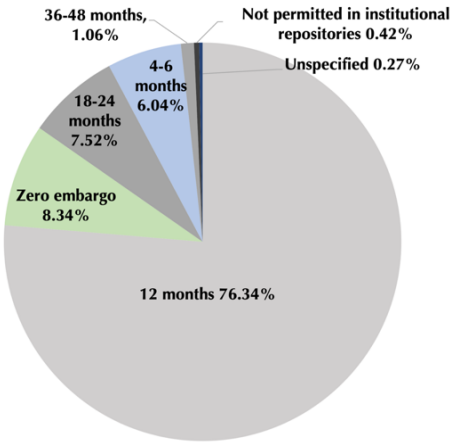

Figure 2: Embargo periods for accepted manuscripts of non-open access articles (43.76%; n = 3,309) if deposited in institutional repositories

Embargoes on accepted manuscripts of non-open access articles in institutional repositories

Analysis of the non-open access articles with accepted manuscripts in institutional repositories found a total of 739 articles. This set of articles equates to 17.17% of non-open access articles and 9.77% of the full 2019 publications set. Most had embargoes of twelve months on access, although there was a small proportion with embargoes of between twelve and forty-eight months after publication, as shown in Figure 3. The

analysis also revealed that over three-quarters of non-open access articles were not in institutional repositories.

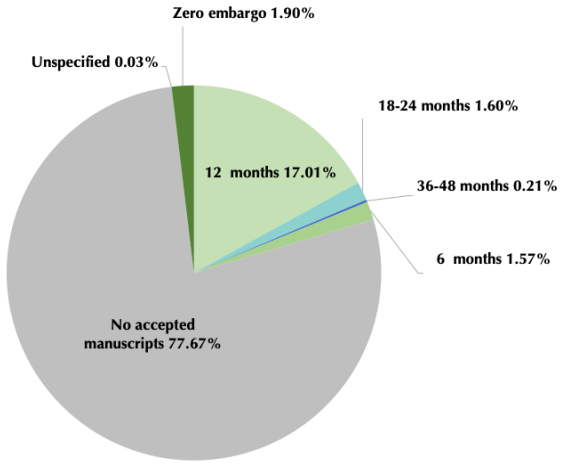

Figure 3: Embargo periods of deposited accepted manuscripts of non-open access articles (43.76%, n=3,309) in institutional repositories

Embargoes and compliance under the National Health and Medical Research Council's Open Access Policy

Articles that were open access either immediately (43.08%, 3,258) or delayed (13.16%, 995) were compliant with Council's timeframe of twelve months. Accepted manuscripts with embargoes of twelve months or less were also compliant. This set comprised 9.65% in institutional repositories and 2.88% in PubMed Central. Figure 4 shows the extent of compliance with the Council's Open Access Policy.

Non-compliance with the Council's Open Access Policy was 30.94%, of which most (30.83%, 2331) were non-open access articles without accepted manuscripts in institutional repositories. A small number of accepted manuscripts in Australian institutional repositories with embargo periods of more than twelve months were not compliant. Under some other funder-publisher pathways, identified in Sherpa Romeo, these accepted manuscripts would also be subject to embargo periods of less than twelve months.

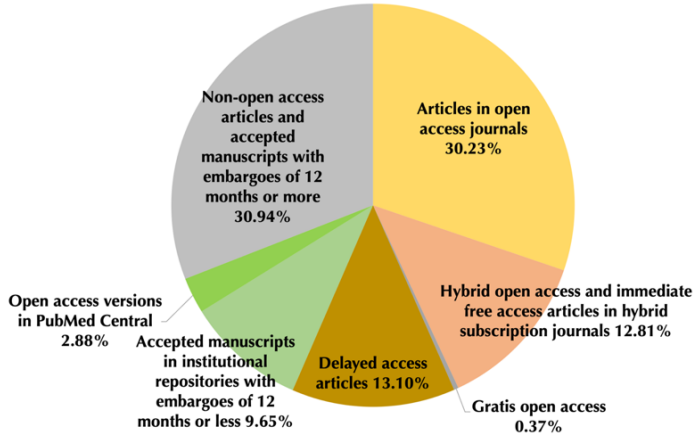

Figure 4: Compliance with the National Health and Medical Research Council's Open Access Policy (100%, n = 7,562)

Embargoes and compliance with Plan S principles

Plan S principles enabled an alternative perspective on the journal articles in this study and reflect the zero-embargo approach of cOAlition S. Figure 5 is a projection representing compliance with the open access principles of Plan S for the population of Council-funded articles. The articles in fully open access journals contributed 30.23% towards Plan S compliance. Accepted manuscripts with zero-embargoes were just over 5% of the total population, with only two with Creative Commons Attribution licences contributing to compliance. A further 15.87% (1,200) of articles published in Plan S transformative journals represented the future potential to be compliant. However, non-compliance with Plan S (48.31%) is high and included

articles in hybrid open access and delayed access journals, and accepted manuscripts with embargoes in repositories.

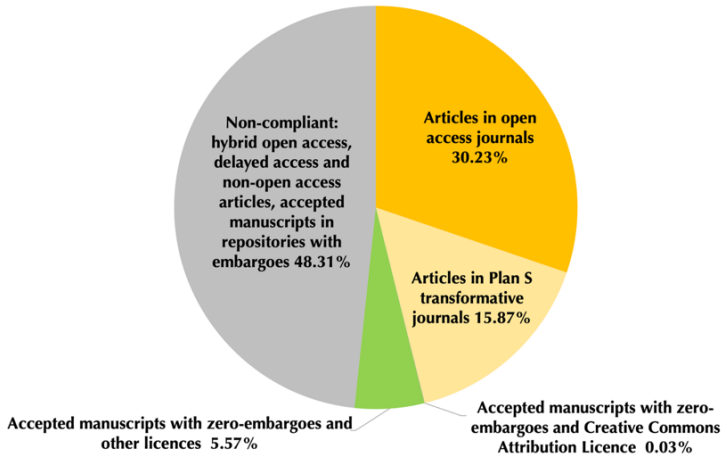

Figure 5: Compliance of National Health and Medical Research Council-funded articles with Plan S principles (100%, n = 7,562)

Discussion

Open access in hybrid subscription journals requires the payment of article processing charges, which is additional to the subscription business model. This study found that non-open access articles in subscription-only and hybrid subscription journals comprised over 40% of the 2019 article set (seen in Figure 1). Authors of non-open access articles can make their articles openly accessible through institutional repositories. However, only 9.65% of non-open access articles had accepted manuscripts in repositories, despite this route having no fees. The large number of non-open access articles and the low engagement by grant recipients in depositing accepted manuscripts in institutional repositories that were found in this research suggest that embargoes complicate a cost-free solution.

The main argument used by publishers for imposing embargoes on accepted manuscripts is to deliver value to subscribers before versions of articles become publicly available. However, publishers' use of embargoes to protect subscription incomes has received considerable criticism (Gadd and Covey, 2019; Gadd et al., 2018; Kingsley, 2014b; Pinfield et al., 2017; Piwowar et al., 2018, 2019; Tennant et al., 2019). Other research has found links between authors' low engagement with institutional repositories and confusion over embargoes on accepted manuscripts (Bakker et al., 2017; Borrego, 2016, 2017; Kirkman, 2018; Kirkman and Haddow, 2020). Subject repositories may increase authors' engagement (Kruesi, et al., 2019; Kruesi, Tanner, et al., 2019), and scholarly collaboration networks, such as ResearchGate, are popular among some researchers (Björk, 2017; Borrego, 2017; Laakso and Lindman, 2016). Notwithstanding, publishers' embargo policies also apply to networking sites and subject repositories.

Following this thread and related to the complexity of embargoes, the authors explored the differences in embargo periods set by funders in association with publishers. This study uncovered pathways listed in Sherpa Romeo with different embargo periods for specific funder conditions based on funder-publisher agreements. Different pathways mean that accepted manuscripts of articles from the same journal may have different embargo periods, some of which will be compliant with some funders' timeframes but not others. Indeed, a small number of accepted manuscripts in Australian institutional repositories had embargo periods of more than twelve months whereas articles in the same journal but supported by a different funder would have a shorter embargo due to the specific funder-publisher agreement. Of concern is that some publisher-funder agreements negotiate shorter embargo periods, but these arrangements appeared to apply only to publications supported by select funders.

Articles with embargo periods of more than twelve months are non-compliant with the Council's Open Access Policy and are known to affect open access compliance (Khoo and Lay, 2018). The level of non-compliance for the 2019 publications set (30.94%) has not improved over the five years since an earlier study of Council-funded articles published in 2013 and 2014 (Kirkman and Haddow, 2020). Most of the non-open access and non-compliant articles in this 2019 publications study had embargo periods of twelve months or less (seen in Figure 4). It is possible that the licence requirements accompanying embargo policies

explain the low deposit of accepted manuscripts, even with shorter embargo periods (Baldwin and Pinfield, 2018). The immediate deposit of accepted manuscripts at the time of publishers' acceptance increases compliance with institutional policies, but previous research has found that such mandates heighten tensions between repository staff and researchers (Fraser, et al., 2018; Ten Holter, 2020).

Examining how articles funded by an Australian funder would perform under Plan S principles, we found that publishing in fully open access journals and transformative journals promise the increased growth of immediate open access publishing. However, publishers' zero-embargo policies are rare for accepted manuscripts deposited in institutional repositories, and even fewer are released under Creative Commons Attribution licences by publishers (Flanagan, et al., 2020). An opportunity to boost grant recipients' engagement with repositories is available to funders in negotiating zero-embargo conditions. In addition, meaningful recognition by the Council of the rapidly evolving global open access context would be of benefit.

Embargoes are very much part of international developments, including the immediate open access and zero-embargo policies of Plan S and other initiatives (Flanagan, et al., 2020). For progression to an immediate open access movement, embargoes on access to accepted manuscripts need reassessment and a more international approach. Funder open access policies lack uniformity in their open access timeframes. For example, the United Kingdom's Research Evaluation Framework mandates the deposit of accepted manuscripts in institutional repositories at the time of acceptance, while the National Institutes of Health and the National Health and Medical Research Council policies allow twelve months from the date of acceptance before deposit. Under Plan S, cOAlition S funders require immediate open access. Greater global coordination of approaches to embargoes, including publisher-funder agreements, would benefit the open access movement.

For authors, embargoes complicate the simple notion of depositing accepted manuscripts in institutional repositories. Funders have the responsibility to facilitate access to publicly funded research, including accepted manuscripts in institutional repositories. The immediate deposit of accepted manuscripts in institutional repositories at the time of acceptance is a partial solution. The promotion of zero-embargoed journals and publisher adoption of zero-embargo policies would also achieve higher open access and compliance with the Council's Open Access Policy. However, publishers' embargoes, even zero-embargo policies, are accompanied by licence and copyright complexities. The adequate resourcing of institutional repositories will be necessary to meet the challenges of open access through this route, including clarifying the many issues involved in the management of embargoes.

Limitations

This study relied on the funding acknowledgement data in Web of Science and the strength of that data was the reason for its selection as a data source. However, the authors are aware of the database's limitations and recognise that the inclusion of other large databases may have retrieved additional or different data. The quantitative nature of bibliometric methods has accepted shortcomings. Deeper understandings of the processes involved in managing embargoed open access versions in institutional repositories are not available in such studies and qualitative approaches, such as interviews with repository managers, would provide an alternative view.

This study followed the established bibliometric counting practice of tallying published articles first, which means that the study reported lower results for repository open access. A detailed analysis of the Creative Common licences on all accepted manuscripts was unfeasible due to time constraints, with only a limited examination of the licences of articles in journals with zero-embargo policies.

The authors acknowledge that applying Plan S principles to a population of journal articles published in 2019 and funded by the Council is not directly relevant to the requirements for Council-funded Australian medical researchers. However, the analysis sought to benchmark a possible scenario of future trends.

Recommendations for future research

Future research would benefit from qualitative and quantitative investigations into author engagement, or lack of, with depositing accepted manuscripts in institutional repositories. It would be useful to understand the extent and the challenges involved in author submissions to institutional repositories at the time of acceptance. Further qualitative research would identify researchers' knowledge and understanding of embargoes relating to accepted manuscripts.

Prospective studies might also focus on the critical roles of institutional repositories and repository staff in supporting compliance with different embargo periods. To date, little research exists on the embargoes and the diverse research outputs produced by the arts, humanities, and social sciences. Investigations in this area would extend knowledge into open access across disciplines to better understand all scholarly communities' approaches and benchmarks.

Comparative studies into the similarities and differences between funder policies would provide information on national and global trends, especially about accepted manuscripts and institutional repositories. The analysis of publications produced from grants from multiple funders is another topic of interest, as is author preferences and awareness of embargoes and different publishers' policy. Plan S principles and the effects of zero-embargo models are also worthy of closer examination and longitudinal studies.

Conclusion

This study is the first in Australia to examine the different embargo periods on accepted manuscripts in institutional repositories. An important finding was there was little difference between the pattern of the embargo periods for accepted manuscripts in institutional repositories and that for the large quantity of non-open access articles: most were twelve months or less. However, for 30% of the articles in hybrid subscription journals, grant recipients opted not to make their publications openly accessible or deposit the accepted manuscripts of non-open access articles in institutional repositories. For some authors, the cost of article processing charges is a deterrent to publishing open access. Depositing accepted manuscripts in institutional repositories is a readily available and low-cost solution for authors to be open access compliant while also providing equitable access. However, different publishers' embargo periods and funder pathways complicate this cost-free solution.

The immediate deposit of accepted manuscripts of non-open access articles in institutional repositories is an avenue for the National Health and Medical Research Council to achieve greater compliance. The Council's promotion of zero-embargoed journals and adopting zero-embargo agreements with publishers for funded articles would achieve higher open access levels and compliance. Notwithstanding, publishers' embargoes, even zero-embargo policies, involve licences and copyright complexities. Understanding how the different aspects of open access (article processing charges, funder policies, publisher embargo periods), and Creative Commons licences on accepted manuscripts interact and influence open access publishing choices is essential to address. In doing so, these interactions and influences, especially embargoes, will advance open knowledge and contribute to equitable and timely access to research funded by the public purse.

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Conflict of interest declaration

The paper is a continuation of the authors' research interests in open access funder policies. No grant supported this research, and the authors declare no conflict of interest.

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References

Note: A link from the title is to an open access document. A link from the DOI is to the publisher's page for the document.

- Australian Research Council. (2017). *Open access policy*. ARC. http://www.arc.gov.au/arc-open-access-policy-version-20171 (Archived by the Internet Archive at https://bit.ly/3lYyOTS)
- Bakker, C., Stephenson, C. A., Stephenson, E., & Chaves, D. (2017). Public funding and open access to research: a review of Canadian multiple sclerosis research. *Journal of Medical Internet Research, 19*(2), e52. https://doi.org/10.2196/jmir.6250 (Archived by the Internet Archive at https://bit.ly/3s9UmOq)
- Baldwin, J., & Pinfield, S. (2018). The UK Scholarly Communication Licence: attempting to cut through the Gordian Knot of the complexities of funder mandates, publisher embargoes and researcher caution in achieving open access. *Publications, 6*(3), article 31. https://doi.org/10.3390/publications6030031 (Archived by the Internet Archive at https://bit.ly/3s9zyGM)
- *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities*. (2003). Max Planck. https://openaccess.mpg.de/Berlin-Declaration (Archived by the Internet Archive at https://bit.ly/3AFsdBM)
- Berners-Lee, T., De Roure, D., Harnad, S., & Shadbolt, N. (2005). Journal publishing and author self-archiving: peaceful co-existence and fruitful collaboration. http://eprints.soton.ac.uk/id/eprint/261160
- *Bethesda Statement on Open Access Publishing*. (2003). Harvard University. Office for Scholarly Communication. (Archived by the Internet Archive at https://bit.ly/2VIUnwK
- Björk, B.-C. (2017). Gold, green, and black open access. *Learned Publishing, 30*(2), 173-175. https://doi.org/10.1002/leap.1096
- Björk, B.-C., Laakso, M., Welling, P., & Paetau, P. (2014). Anatomy of green open access. *Journal of the Association for Information Science and Technology, 65*(2), 237-250. https://doi.org/10.1002/asi.22963
- Borchert, M., Harrison, A., Heath, A., Tiffen, B., Fletcher, J., Dewis, K., Frances, M., Barbour, V., Simons, N., Hickie, J., Rolf, H., Sussman, A., and Benn, J. (2019). *CAUL review of Australian repository infrastructure: a project within the CAUL Fair, affordable and open access to knowledge program*. Council of Australian University Libraries. https://bit.ly/3xB8zVO (Archived by the Internet Archive at https://bit.ly/37D38eE)
- Borrego, Á. (2016). Measuring compliance with a Spanish Government open access mandate. *Journal of the Association for Information Science and Technology, 67*(4), 757-764. https://doi.org/10.1002/asi.23422
- Borrego, Á. (2017). Institutional repositories versus ResearchGate: the depositing habits of Spanish researchers. *Learned Publishing, 30*(3), 185-192. https://doi.org/10.1002/leap.1099
- Budapest Open Access Initiative. (2002). Read the Budapest Open Access Initiative. http://www.budapestopenaccessinitiative.org/read. (Archived by the Internet Archive at https://bit.ly/3iGUiTj)
- cOAlition S. (2019a). *Accelerating the transition to full and immediate Open Access to scientific publications*. Science Europe. https://bit.ly/3jS0yqv (Archived by the Internet Archive at https://bit.ly/3sat2zH)
- cOAlition S. (2019b). *Plan S: Principles and implementation.* Science Europe. https://bit.ly/3lTV69r (Archived by the Internet Archive at https://bit.ly/3iD6C6W)
- cOAlition S. (2019c). *Rationale for the revisions made to Plan S principles and implementation guidance.* European Science Foundation. https://www.coalition-s.org/rationale-for-the-revisions/ (Archived by the Internet Archive at https://bit.ly/3fY5fhn)
- cOAlition S. (2021). *List of Plan S compliant transformative journals*. European Science Foundation. https://www.coalition-s.org/plan-s-compliant-transformative-journals/ (Archived by the Internet Archive at https://bit.ly/3jPd2zh)

- Council of Australian University Librarians, & Australasian Open Access Strategy Group. (2019). *Joint response to Plan S implementation guidelines*. Council of Australian University Librarians & the Australasian Open Access Strategy Group. https://www.caul.edu.au/sites/default/files/documents/caul-doc/plans2019response.pdf (Archived by the Internet Archive at https://bit.ly/3Azq8aE)
- Devasahayam, A. (2020). Availability of research articles for the public during pandemic - a case study. *LIBER Quarterly, 30*(1), 1-11. http://doi.org/10.18352/lq.10340
- Ellingson, M. K., Shi, X., Skydel, J. J., Nyhan, K., Lehman, R., Ross, J. S., & Wallach, J. D. (2021). Publishing at any cost: a cross-sectional study of the amount that medical researchers spend on open access publishing each year. *BMJ Open, 11*(2), e047107. http://dx.doi.org/10.1136/bmjopen-2020-047107. (Archived by the Internet Archive at https://bit.ly/37zl7Tb)
- Ellison, T. S., Koder, T., Schmidt, L., Williams, A., & Winchester, C. C. (2019). Open access policies of leading medical journals: a cross-sectional study. *BMJ Open, 9*(6), e028655. http://dx.doi.org/10.1136/bmjopen-2018-028655 (Archived by the Internet Archive at https://bit.ly/3fX6r4T)
- Elsevier. (2021). *Journal specific embargo periods*. Elsevier. https://www.elsevier.com/open-access/journal-embargo-finder (Archived by the Internet Archive at https://bit.ly/3jPfwxB)
- FAIR Steering Group. (2017). *Policy statement on F.A.I.R. access to Australia's research outputs.* https://www.fair-access.net.au/fair-statement. (Archived by the Internet Archive at http://web.archive.org/web/20210226083724/https://www.fair-access.net.au/fair-statement)
- Flanagan, D., Barbour, V., Nicholls, S., Saville, M., Slocombe, A., Steel, K., Thomas, A., Yeend, S., & Clark, C. (2020). *Roadmap to Plan S for Australia: final report*. Council of Australian University Librarians. https://www.caul.edu.au/sites/default/files/documents/fair-access/caul2020roadmap-plans.pdf (Archived by the Internet Archive at https://bit.ly/2VTLd0J)
- Fraser, C., Hill, G., Snaith, H., & Taffs, J. (2018). *Monitoring sector progress towards compliance with funder open access policies*. Research England. https://re.ukri.org/sector-guidance/publications/monitoring-sector-progress-towards-compliance-with-funder-open-access-policies/ (Archived by the Internet Archive at https://bit.ly/3g0bjpL)
- Gadd, E., & Covey, D. T. (2019). What does 'green' open access mean? Tracking twelve years of changes to journal publisher self-archiving policies. *Journal of Librarianship and Information Science, 51*(1), 1-17. https://doi.org/10.1177/0961000616657406
- Gadd, E., Fry, J., & Creaser, C. (2018). The influence of journal publisher characteristics on open access policy trends. *Scientometrics, 115*(3), 1371-1393. https://doi.org/10.1007/s11192-018-2716-8
- Hampson, G. (2019). *OSI policy perspective 1: Plan S and the quest for global open access*. Science Communication Institute. https://doi.org/10.13021/osi2019.2450
- Henty, M. (2014). *2014 Research publications repository survey report*. Council of Australian University Librarians. https://www.caul.edu.au (Archived by the Internet Archive at https://bit.ly/3fY9FEZ)
- Herrmannova, D., Pontika, N., & Knoth, P. (2019). Do authors deposit on time? Tracking open access policy compliance. In *2019 ACM/IEEE Joint Conference on Digital Libraries: JCDL 2019* (pp. 206-216). ACM/IEEE. https://doi.org/10.1109/JCDL.2019.00037
- Huang, C.-K., Neylon, C., Hosking, R., Montgomery, L., Wilson, K. S., Ozaygen, A., & Brookes-Kenworthy, C. (2020). Meta-research: evaluating the impact of open access policies on research institutions. *Elife, 9*, e57067. https://doi.org/10.7554/eLife.57067 (Archived by the Internet Archive at https://web.archive.org/web/20210104032713/https://elifesciences.org/articles/57067)
- Huggard, S., Steel, K., & Sussman, A. (2017). *Research publications repository survey report 2017*. Council of Australian University Librarians. https:/www.caul.edu.au/sites/default/files/documents/research/caul2017rprs-report.pdf (Archived by the Internet Archive at https://bit.ly/3yJrZsT)
- Jisc. (2020). *Sherpa Romeo user guide*. Jisc. https://v2.sherpa.ac.uk/romeo/resources/user-guide.pdf (Archived by the Internet Archive at https://bit.ly/3lV8DO0)
- Khoo, S. Y.-S. (2019). Article processing charge hyperinflation and price insensitivity: an open access sequel to the serials crisis. *LIBER Quarterly, 29*(1), 1-18. http://doi.org/10.18352/lq.10280
- Khoo, S. Y.-S., & Lay, B. P. P. (2018). A very long embargo: journal choice reveals active non-compliance with funder open access policies by Australian and Canadian neuroscientists. *LIBER Quarterly, 28*(1), 1-19. https://doi.org/10.18352/lq.10252
- Kingsley, D. (2014, May 18). Addressing the 'double dipping' charge. *Australian Open Access Strategy Group.* https://aoasg.org.au/news-updates/blog-summary/addressing-the-double-dipping-charge/ (Archived by the Internet Archive at https://bit.ly/3jRKGEy)

- Kingsley, D. (2014). Paying for publication: issues and challenges for sesearch support services. *Australian Academic and Research Libraries, 45*(4), 262-281. https://doi.org/10.1080/00048623.2014.945135
- Kirkman, N. (2018). *A study of open access publishing by NHMRC grant recipients.* [Unpublished masters dissertation]. Curtin University. https://espace.curtin.edu.au/handle/20.500.11937/77026
- Kirkman, N., & Haddow, G. (2020). Compliance with the first funder open access policy in Australia. *Information Research, 24*(4), paper 857. http://informationr.net/ir/25-2/paper857.html (Archived by the Internet Archive at https://bit.ly/36Dj4fx)
- Kruesi, L. M., Burstein, F. V., & Tanner, K. J. (2019). With open science gaining traction, do we need an Australasia PubMed Central (PMC)? A qualitative investigation. *PLOS ONE, 14*(2), e0212843. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0212843. https://doi.org/10.1371/journal.pone.0212843 (Archived by the Internet Archive at https://bit.ly/3fWoojQ)
- Kruesi, L. M., Tanner, K. J., & Burstein, F. V. (2019). Advancing scholarly publishing through open access biomedical repositories: a knowledge management perspective. *IFLA Journal, 45*(3), 233-245. https://doi.org/10.1177/0340035219846139
- Laakso, M., & Lindman, J. (2016). Journal copyright restrictions and actual open access availability: a study of articles published in eight top information systems journals (2010–2014). *Scientometrics, 109*(2), 1167-1189. https://doi.org/10.1007/s11192-016-2078-z
- Ligue des Bibliothèques Européennes de Recherche. (2021a). *Draft law for the use of publicly funded scholarly publications*. Ligue des Bibliothèques Européennes de Recherche. https://libereurope.eu/draft-law-for-the-use-of-publicly-funded-scholarly-publications/ (Archived by the Internet Archive at https://bit.ly/3xITVvA)
- Ligue des Bibliothèques Européennes de Recherche. (2021b). *Pan-European model law for the use of publicly funded scientific publications.* Ligue des Bibliothèques Européennes de Recherche. https://libereurope.eu/press-release-model-law-zero-embargo/ (Archived by the Internet Archive at https://bit.ly/3lYNoLi)
- Martín-Martín, A., Costas, R., van Leeuwen, T., & López-Cózar, E. D. (2018). Evidence of open access of scientific publications in Google Scholar: a large-scale analysis. *Journal of Informetrics, 12*(3), 819–841. https://doi.org/10.1016/j.joi.2018.06.012
- Max Planck Society. (2013). *Mission statement at the Berlin 11 Open Access Conference of the Max Planck Society (20 Nov 2013): ten years after the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities*. Max Planck Society. https://openaccess.mpg.de/mission-statement_en (Archived by the Internet Archive at https://bit.ly/3jNhtup)
- National Health and Medical Research Council. (2018). *Open access policy*. NHMRC. https://www.nhmrc.gov.au/about-us/resources/open-access-policy (Archived by the Internet Archive at https://bit.ly/3m3Nu4p)
- Nicholas, D., Rodríguez-Bravo, B., Watkinson, A., Boukacem-Zeghmouri, C., Herman, E., Xu, J., Abrizah, A., & Świgoń, M. (2017). Early career researchers and their publishing and authorship practices. *Learned Publishing, 30*(3), 205-217. https://doi.org/10.1002/leap.1087
- Papillon, M., O'Neill, B., Bourque, M., Marland, A., & White, G. (2019). Open access and academic journals in Canada: a political science perspective. *Canadian Journal of Political Science/Revue canadienne de science politique, 52*(4), 903-922. https://doi.org/10.1017/S0008423919000799
- Peterson, A. T., Johnson, P. E., Barve, N., Emmett, A., Greenberg, M. L., Bolick, J., & Qiao, H. (2019). The NIH public access policy did not harm biomedical journals. *PLOS Biology, 17*(10), e3000352. https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000352 https://doi.org/10.1371/journal.pbio.3000352 (Archived by the Internet Archive at https://bit.ly/3iIxrqC)
- Pinfield, S., Salter, J., & Bath, P. A. (2016). The "total cost of publication" in a hybrid open-access environment: institutional approaches to funding journal article-processing charges in combination with subscriptions. *Journal of the Association for Information Science and Technology, 67*(7), 1751-1766. https://doi.org/10.1002/asi.23446
- Pinfield, S., Salter, J., & Bath, P. A. (2017). A "Gold-centric" implementation of open access: hybrid journals, the "total cost of publication", and policy development in the UK and beyond. *Journal of the Association for Information Science and Technology, 68*(9), 2248-2263. https://doi.org/10.1002/asi.23742
- Piwowar, H., Priem, J., & Orr, R. (2019). The future of OA: a large-scale analysis projecting open access publication and readership. *BioRxiv*, 795310. http://dx.doi.org/10.1101/795310

- Piwowar, H. A., Priem, J., Larivière, V., Alperin, J. P., Matthias, L., Norlander, B., Farley, A., West, J., & Haustein, S. (2018). The state of OA: a large-scale analysis of the prevalence and impact of open access articles. *PeerJ Preprints, 6*, e4375. https://peerj.com/articles/4375/. https://doi.org/10.7717/peerj.4375 (Archived by the Internet Archive at https://bit.ly/3jTHtV9)
- Poynder, R. (2017). *Copyright: the immoveable barrier that open access advocates underestimated*. http://www.richardpoynder.co.uk/Copyright.pdf (Archived by the Internet Archive at https://bit.ly/3scCrqu)
- Schiltz, M. (2018). Science without publication paywalls: cOAlition S for the realisation of full and immediate open access. *PLOS Medicine, 15*(9), e1002663. https://bit.ly/2XhVVhT. https://doi.org/10.1371/journal.pmed.1002663 (Archived by the Internet Archive at https://bit.ly/3xFdg0Y)
- Seaman, D. M. (2017). Leading across boundaries: collaborative leadership and the institutional repository in research universities and liberal arts colleges. [Unpublished doctoral dissertation]. Simmons University, Boston, Massachusetts. https://bit.ly/37GGWjH
- Sutton, S. C. (2013). Open access, publisher embargoes, and the voluntary nature of scholarship: an analysis. *College and Research Libraries News, 74*(9), 468-472. https://doi.org/10.5860/crln.74.9.9008
- Tavernier, W. (2020). COVID-19 demonstrates the value of open access: what happens next? *College and Research Libraries News, 81*(5), 226. https://doi.org/10.5860/crln.81.5.226
- Taylor, S. (2020). *Publishers allowing AAM ('postprint') posting to repositories without embargo*. https://bit.ly/3CLwR35 (Archived by the Internet Archive at https://bit.ly/3yJz8cT)
- Ten Holter, C. (2020). The repository, the researcher, and the REF: "It's just compliance, compliance, compliance". *The Journal of Academic Librarianship, 46*(1), 1-12. https://doi.org/10.1016/j.acalib.2019.102079
- Tennant, J. P., Crane, H., Crick, T., Davila, J., Enkhbayar, A., Havemann, J., Kramer, B., Martin, R., Masuzzo, P., & Nobes, A. (2019). Ten hot topics around scholarly publishing. *Publications, 7*(2), 34. https://doi.org/10.3390/publications7020034
- United States. *Department of Health and Human Services.* (2008). *Revised policy on enhancing public access to archived publications resulting from NIH-funded research*. Department of Health and Human services. https://grants.nih.gov/grants/guide/notice-files/NOT-OD-08-033.html (Archived by the Internet Archive at https://bit.ly/3xBAl4w)
- Velterop, J.M. (2005). *Open access publishing and scholarly societies: a guide.* Open Society Institute. https://bit.ly/3xNl5BS. (Archived by the Internet Archive at https://bit.ly/3g0POVN)
- Zhu, Y. (2017). Who support open access publishing? Gender, discipline, seniority and other factors associated with academics' OA practice. *Scientometrics, 111*(2), 557-579. https://doi.org/10.1007/s11192-017-2316-z

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