

State of open access in Aotearoa Year 3

Slow progress, increased cost of APCs, repositories under-utilised

Executive summary

In 2019	State
44% open	Our proportion of open publications has crept up over three years but still less than half our publications are accessible without payment. Books remain almost all closed.
26% open on publication	Only one-quarter of our publications is definitely open at the time of publication.
50-60% open (top 5 funders)	Research funded by our top five national funding agencies is slightly more likely to be accessible.
52% higher citations	Citation rates are consistently higher for open, in line with our previous findings.
US\$2.7m estimated APCs in 2019	The increase in open is largely due to our researchers paying more often for OA. Gold and Hybrid are up in number of publications and associated APC costs. Thus, the estimated cost of APCs has risen year-by-year, with the 2019 figure (US\$2.7 million) nearly double that of 2017. Springer Nature accounts for over ½ million dollars of the 2019 APCs.
Researchers are increasingly publishing with OA-only publishers	In keeping with the rise in Gold we are seeing our researchers publish more with OA-only publishers, i.e. those our libraries have no relationship with. MDPI and Frontiers are now in the top 10 publishers overall and are 2nd and 3rd for open access (OA) publishers by number of articles.
New Zealand lags behind other countries	New Zealand lags behind other countries in <ul style="list-style-type: none">- the proportion of all our work that is accessible without payment,- the proportion of OA work funded by major funding agencies,- use of our institutional repositories, and- policy at institutional, funder and national levels.
70% potential OA	If we deposited all eligible accepted manuscripts in our repositories the proportion of our 2019 work that is free-to-access would increase from 44% to 70% without further APC costs.

Scope of study

This is the third iteration of our work, meaning we can start to analyse trends over time. Our dataset comprises publications from 2017 - 2019 with a Digital Object Identifier (DOI) with at least one researcher affiliated with a New Zealand university. Our figures include books and book chapters but we note these represent only a small proportion of our publications; there is no APC information readily available for open books and so APC estimates only count journal articles. Any publication not indexed in Scopus/Web of Science or without a DOI (e.g. print books and many New Zealand journals such as NZ Medical Journal or NZ Law Journal, etc.) is not included.

What is the global context?

2020 and 2021 have seen rapid change in the OA space.

- CAUL negotiated [Read and Publish agreements](#) with CSIRO Publishing, Future Science Group, Geological Society of London, Karger, Microbiology Society, Portland Press and Royal Society.
- Australian chief scientist Dr Cathy Foley announced open access to scientific literature and open research as one of the four foundational issues for her term as Chief Scientist.
- An intern in the Office of the Prime Minister's Chief Science Advisor has been working with New Zealand funders on OA.
- University of California announced a four year OA [agreement](#) with Elsevier after a long stalemate.
- UNESCO drafted the [UNESCO Recommendation on Open Science](#), due for adoption in November.
- UKRI announced a new Open Access [Policy](#).
- Coalition S released its [Rights Retention Strategy](#).

Analysis of 2019 publications and trends 2017-19

How much of our research is open?

Our proportion of open work in 2019 is 44%, up from 41% in 2017 and 40% in 2018 (Table 1). It is worth noting that about only one-quarter of our publications is definitely open at the time of publication because Green and Bronze publications may have become open at a later date. Books are almost all closed (around 90%).

	2017	2018	2019
Closed	59%	60%	56%
Open	41%	40%	44%
Open at time of publication (Gold, Hybrid, Diamond)	22%	20%	25%

Table 1: Overall OA proportion over time

In terms of the different types of access (Figures 1 and 2), the most notable change is the increase in Gold from 14% to 17%. This represents an increase from 2017 to 2019 of 485 publications that may have incurred an APC.

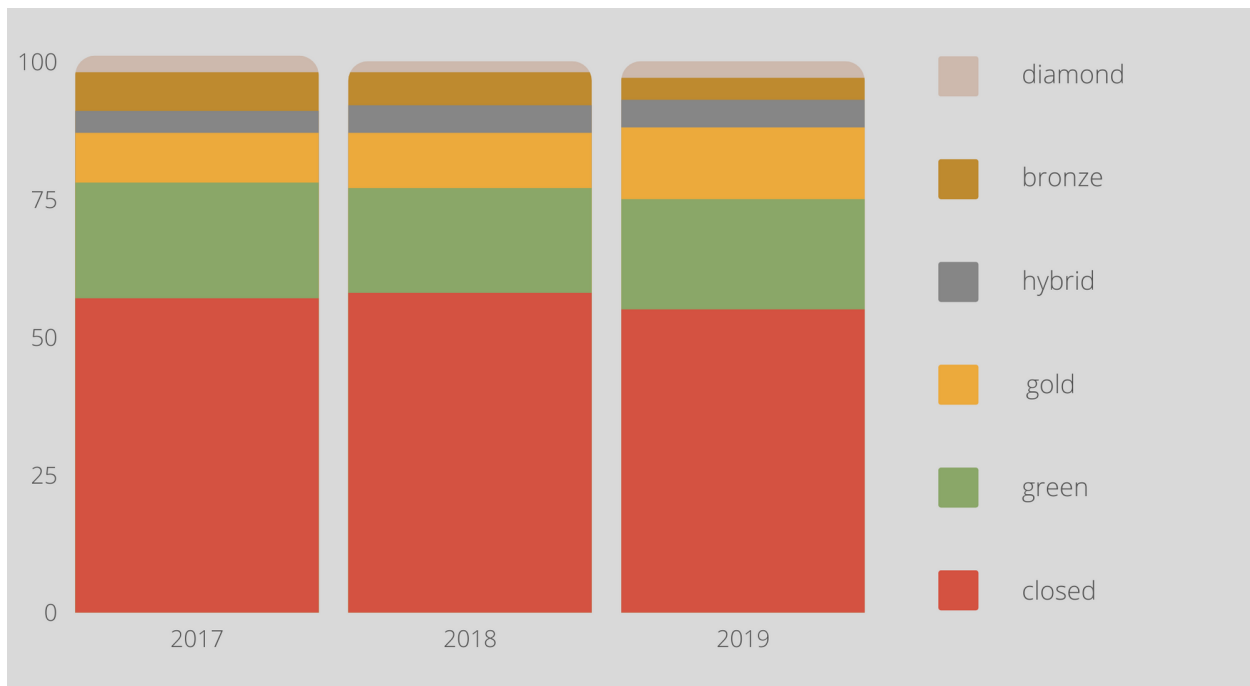


Figure 1: OA Status - change over time by proportion

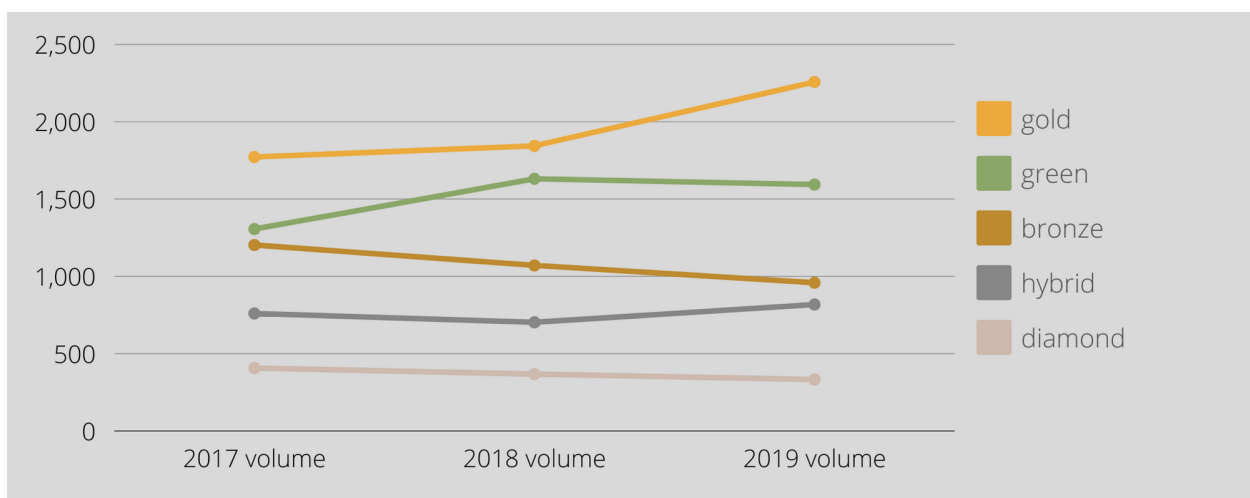


Figure 2: Open outputs - change over time by volume

What is the relationship between open access and citations?

For the third year in a row, the data shows that OA has a positive effect on citations, with open research outputs achieving 52% more citations on average (see Figure 3). Green (6.3 citations on average) in particular continues to perform strongly against Closed (4.4 citations on average).

No notable change within type of access was evident across the 3 year period. Hybrid continues to be the most cited OA type, but at a considerably higher cost, as detailed below.

Likewise, it is now well established that open research generates more engagement with the media. Open access outputs for 2019 were 5 times more likely to receive media attention than Closed.

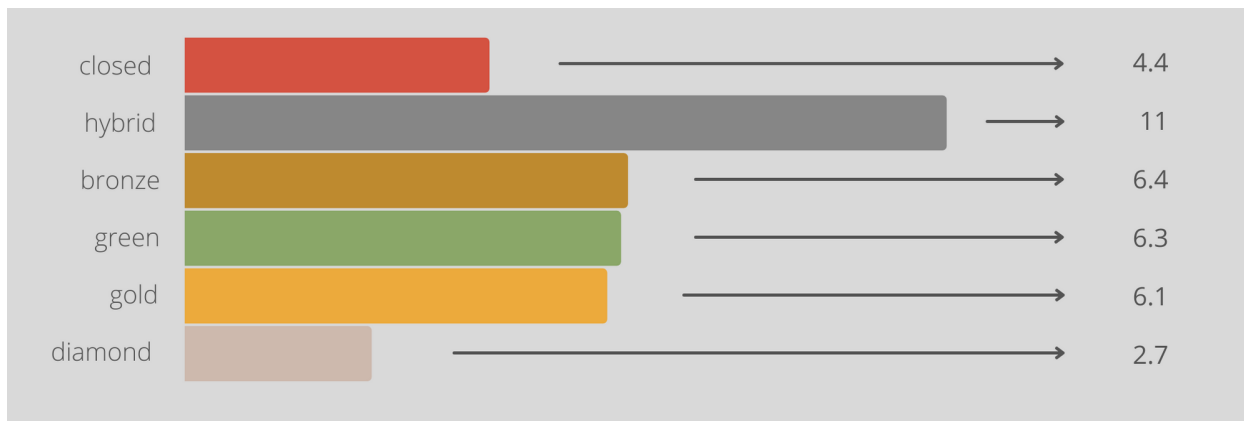


Figure 3: Average citations for 2019 by oa type - all genres

Who are we publishing with and at what cost?

When we look at all publications -- closed and OA -- the “Big Four” commercial publishers are prominent, accounting for a little over half of our publications in each year. There is a clear gap between the big four and other publishers with the 5th placed averaging only around 4% each year.

Publisher	2017	2018	2019
Elsevier BV	20.9% (2624)	18.5% (2490)	20.1% (2620)
Wiley-Blackwell	11.3% (1417)	11.4% (1538)	11.9% (1551)
Springer Nature	13.4% (1687)	10.7% (1438)	11% (1428)
Informa UK Ltd	8.4% (1049)	10% (1344)	9.7% (1260)
Total	54%	51%	53%

Table 2: “Big Four” publishers’ share of volume - all genres, all authors

The proportion for the Big Four drops from around half (as in Table 2) to between 35-40% when we look at only APC-incurring publications (Figure 4).

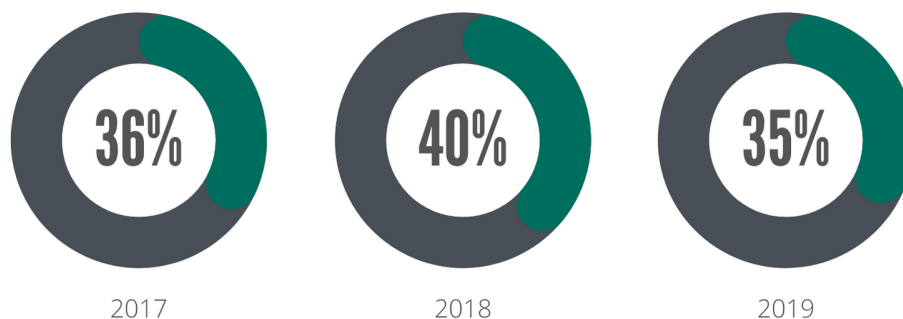


Figure 4: Share of APC spend on Springer, Elsevier, Wiley and Informa

Looking more closely at all publishers to whom we are paying APCs, Table 3 clearly demonstrates a trend of higher spending on OA and an increasing number of Gold and Hybrid publications

nationally across the three years. The total annual spend on both has nearly doubled from 2017 to 2019. The total estimated cost over the three years is over US\$6 million.

Type of APC	2017 USD (no. of publications)	2018 USD (no. of publications)	2019 USD (no. of publications)	Estimated 3-year spend
Gold	\$1,181,041 (699)	\$1,459,402 (970)	\$2,053,821 (1248)	\$4,694,264
Hybrid	\$288,288 (153)	\$586,809 (230)	\$646,848 (271)	\$1,521,945
Total	\$1,469,329 (852)	\$2,046,211 (1200)	\$2,700,669 (1519)	\$6,216,209

Table 3: APC spend in Gold and Hybrid journals - NZ corresponding authors in Gold and Hybrid

Breaking these charges down by publisher, we see the same trend of increased APC charges (Table 4). Springer Nature has by far the highest APC estimate, over half-a-million USD in 2019 that would be additional to subscription costs. Interestingly, OA-only publishers appear in positions two and three on this list, when sorted by total APC estimates in 2019. MDPI is now the most common paid-OA publisher by number of publications (285 in 2019, up from 139 in 2017, overtaking Springer Nature in this measure).

Publisher	2017 USD (no. of publications)	2018 USD (no. of publications)	2019 USD (no. of publications) ↓	Increase from 2017 to 2019
Springer Nature	\$352,279 (192)	\$497,125 (214)	\$530,925 (237)	151%
MDPI	\$200,722 (139)	\$223,660 (182)	\$379,577 (285)	189%
Frontiers	\$198,670 (75)	\$218,790 (97)	\$322,340 (129)	162%
Elsevier BV	\$98,363 (58)	\$234,064 (121)	\$283,178 (131)	288%
Wiley-Blackwell	\$108,460 (47)	\$246,280 (108)	\$256,765 (104)	237%
PLoS	\$98,520 (62)	\$106,010 (66)	\$140,595 (84)	143%
Informa UK Ltd	\$14,600 (13)	\$62,855 (56)	\$130,848 (79)	896%
BMJ	\$56,574 (33)	\$67,501 (35)	\$128,588 (63)	227%
OUP	\$37,586 (17)	\$38,475 (14)	\$93,852 (34)	250%

Table 4: USD expenditure with paid journals - all genres, Gold or and Hybrid and with an NZ corresponding author (Top 8 in 2019). Sorted by APC total 2019

Average price per APC has risen slightly (Figure 5).

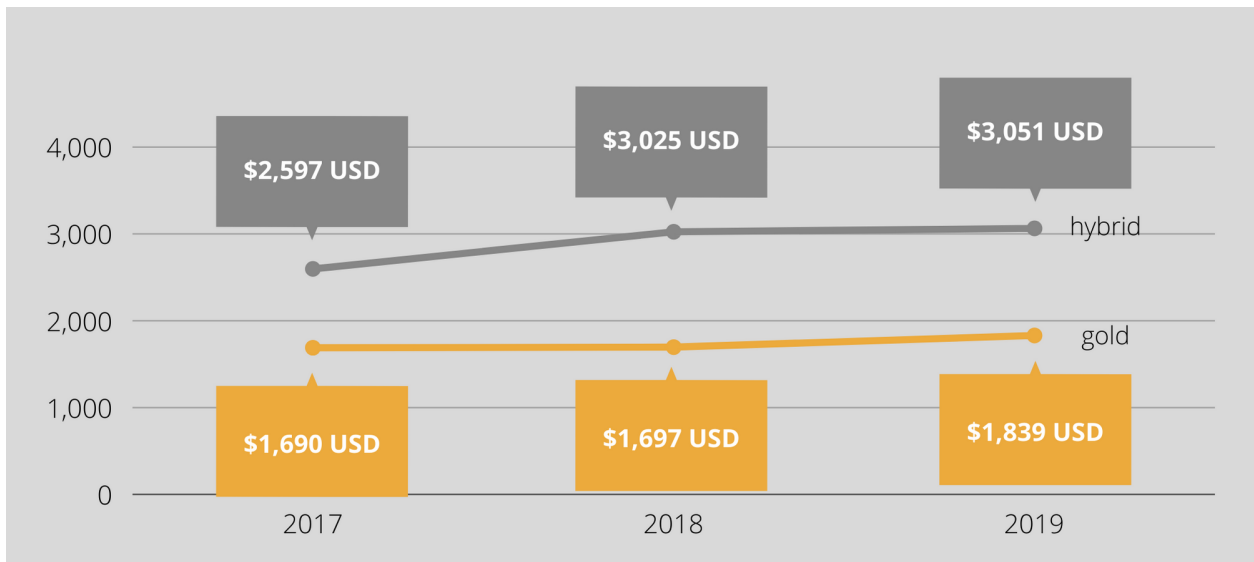


Figure 5: Average APCs - journal articles only with a NZ corresponding author

How do we compare with other countries?

Overall OA progress

International comparisons of OA rates over time reflect different national approaches. Figure 6, sourced from the [COKI Dashboard](#), reveals just how far behind the rest of the world New Zealand is in terms of OA progress. That said, progress has been slow in other countries as well, with a few exceptions.

Note: The method used to determine OA status differs somewhat from the method used in the CONZUL project. The New Zealand figures below are drawn from the COKI dataset, rather than the CONZUL dataset.

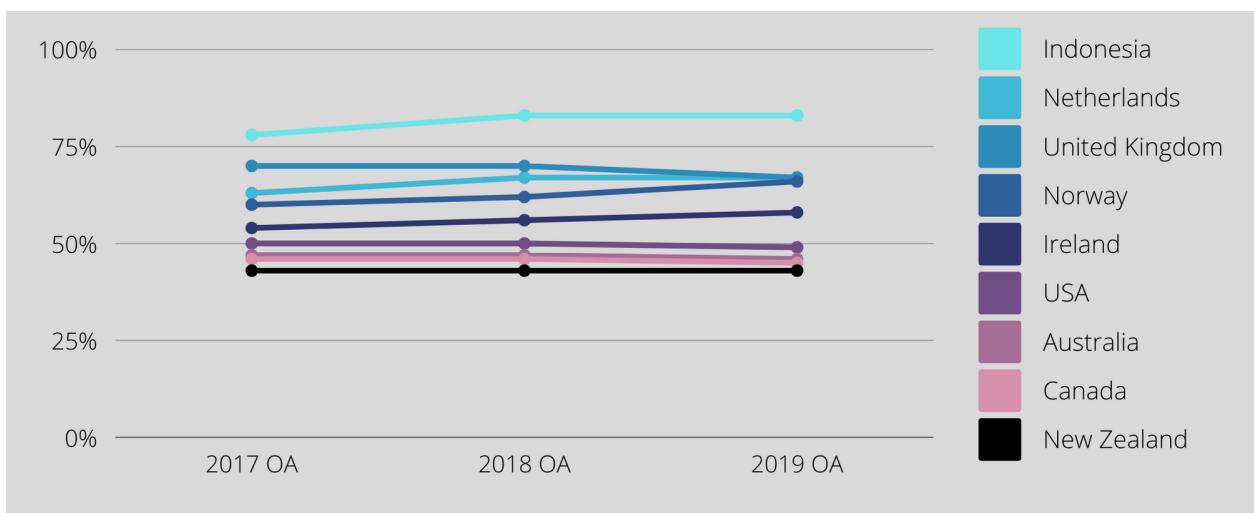


Figure 6: Overall OA Proportion - country comparison from COKI Dashboard

Use of Green OA

One important point here is that Green OA is still heavily used in countries where progress is driven by other types of OA. This is an indication that other countries are leveraging their Green OA systems more effectively than New Zealand, even where this is not the preferred OA mechanism.

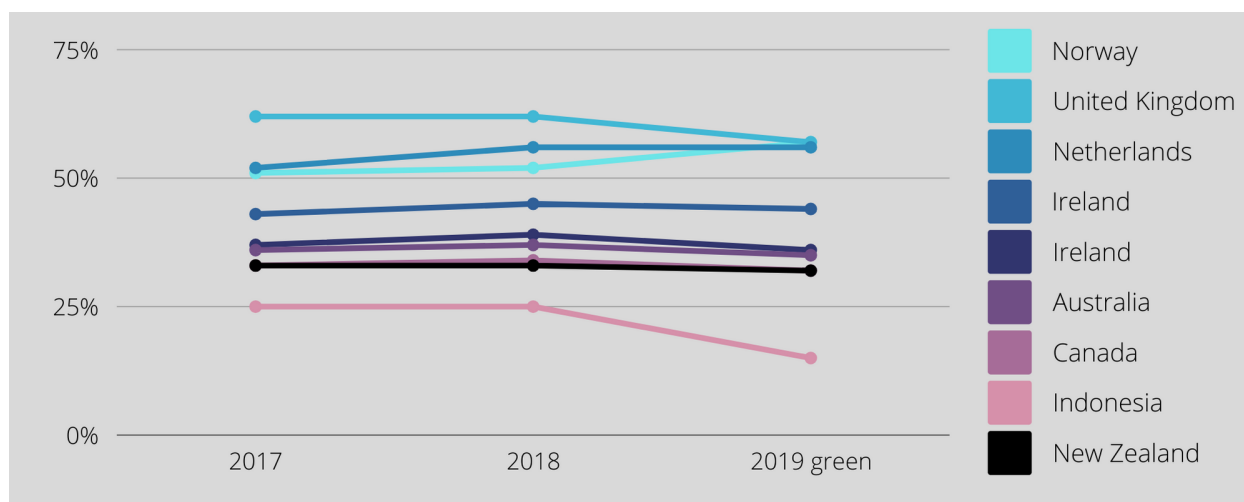


Figure 7: Green OA - country comparison from COKI Dashboard

Funded research

From our own dataset we can examine how much of our publicly-funded research is open compared to that funded by the governments of other countries. Research funded by Marsden, HRC, Royal Society, Rutherford Discovery Fellowship and MBIE is on average 56% open; for Australia their top funders are 70% open; for the US and the UK the figure is around 90%.

Potential for open

As in previous years, a large number of our paywalled journal articles could be made open for free by uploading an accepted manuscript into an institutional repository. 76% of Closed publications are eligible to be made open in this way according to the publisher's guidelines. That's 4,262 publications that could be but are not available to journalists, entrepreneurs/innovators, practitioners, decision-makers and scholars working in environments where increasing budgetary pressure is forcing widespread cancellation of subscriptions.

The data clearly shows that New Zealand authors are under-utilising our institutional repositories, with a mere 212 outputs being made open exclusively through a university repository.

If one author from every publication uploaded an appropriate version to their institutional repository, our overall OA proportion would rise from 44% to 70%, allowing these outputs to achieve their maximum impact.

Recommendations

- Continue to analyse the state of OA each year.
- Use this knowledge to improve the understanding within our universities, with funders and with government agencies. Libraries continue to advocate for open access as a public (and university) good and promote ways to achieve this at the best cost.
- Reconvene the wider project group with other interested parties including CONZUL to determine a way forward for the project, including considering new research questions and exploring other uses for the data.