



Open Access medical research (2011-23): OA journal articles are associated with accelerated research and socio-clinical impact

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BACKGROUND AND OBJECTIVES

- Open Access (OA) has been predicted to accelerate medical science (Woelfle et al., 2011) and expand the audience for research (UNESCO, 2022).
- The annual cost of OA publication fees has been estimated to be \$2B (Zhang et al., 2022).
- Other researchers have identified potential issues with the growth of poor quality OA research (Beall, 2015).
- Previous limited research (Holmberg 2019; Taylor, 2023) has reported some advantages for OA publications, however such research has not addressed the phenomena at scale, nor attempted to understand the consequences of the dominance of OA research.

CONCLUSIONS

- The growth of OA research and the associated impact indicators suggest that OA has increased the overall level of coverage and discussion linked to medical research, and that different forms of OA are not equivalent.
- Traditional journals, whether supported with strong preprint (Green) policies or mixed Gold/Bronze OA publishing dominate all forms of impact.
- The explosive growth of Gold OA journals is not delivering accelerated impact.
- Rates of discourse in News and on X / Twitter have dropped since COVID, although Green maintains a strong advantage.
- There is no evidence that the gap between OA and non-OA closes over time.

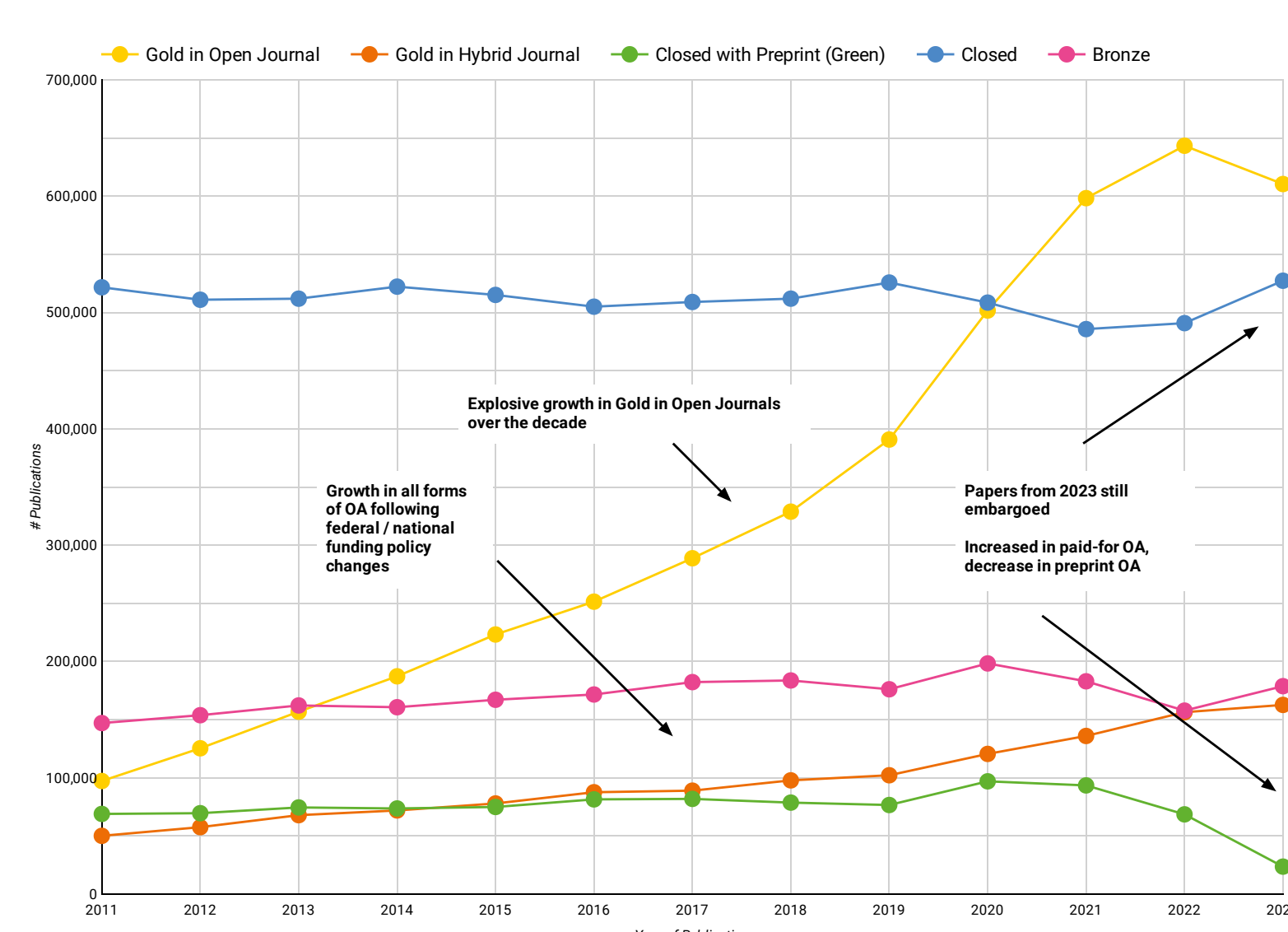
METHODS

Journal articles in medical and clinical fields (N = 15.5M, published between 2011-23) were categorized by OA status (non-OA, Gold in Open Journal, Gold in Hybrid Journal, Preprint in non-OA Journal / Green, and Bronze). Rates in annual citations, Altmetric Attention Score, News, X/Twitter and Policy/CDG metrics were compared, and the results compared with hypotheses that predict the effects of OA research.

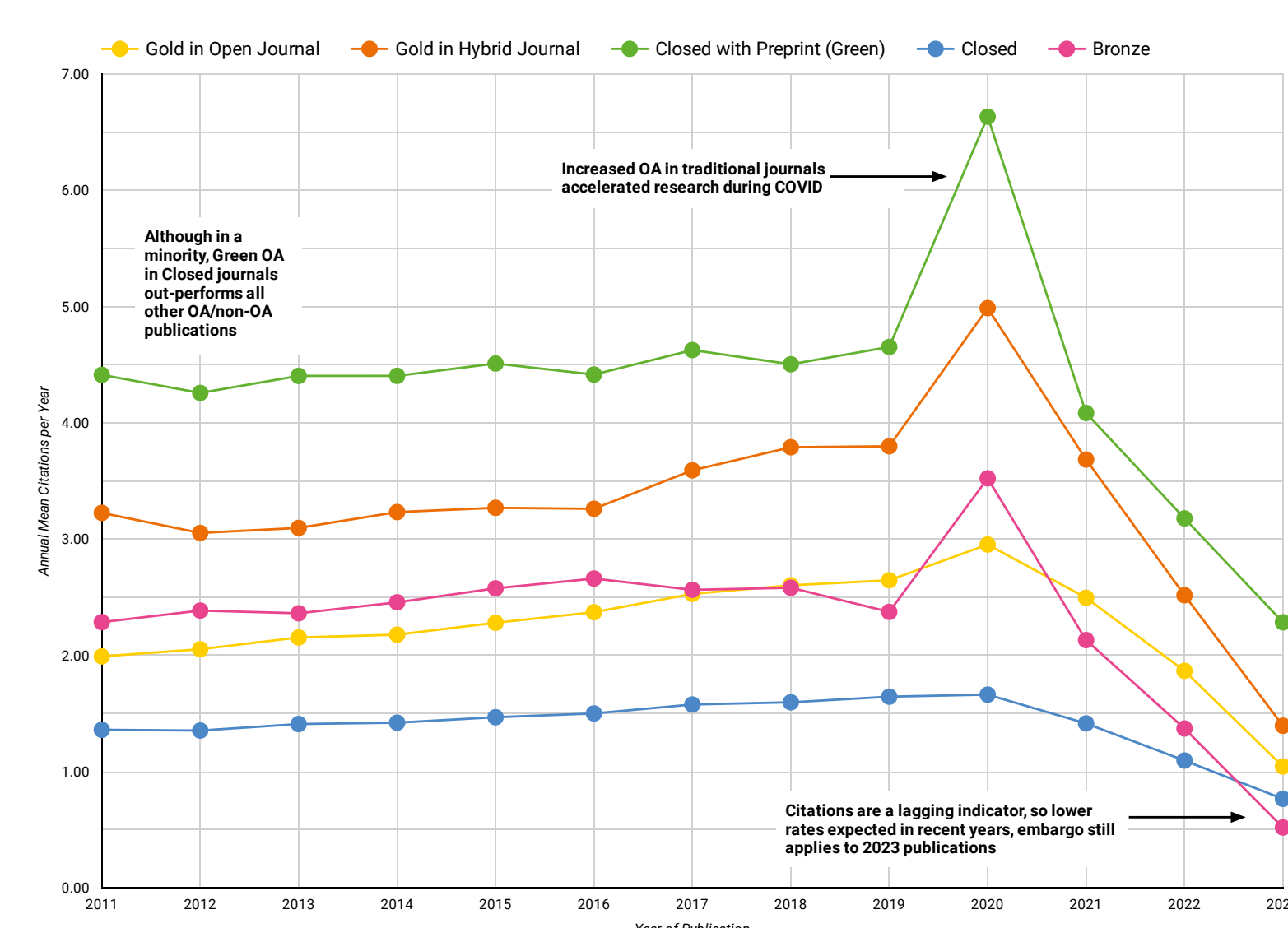
RESULTS

OA papers outperform non-OA papers across all indicators, typically showing a minimum doubling of the coverage or volume of impact. These advantages persisted even as medical research approached 60% OA, showing extensive expansion of discourse around medical research and acceleration of impact. Growth in OA has been largely driven by Gold OA in Open journals, however these publications are not typically highly impactful. Journal articles with preprints (Green) and Gold in Hybrid Journals generally outperform other OA types.

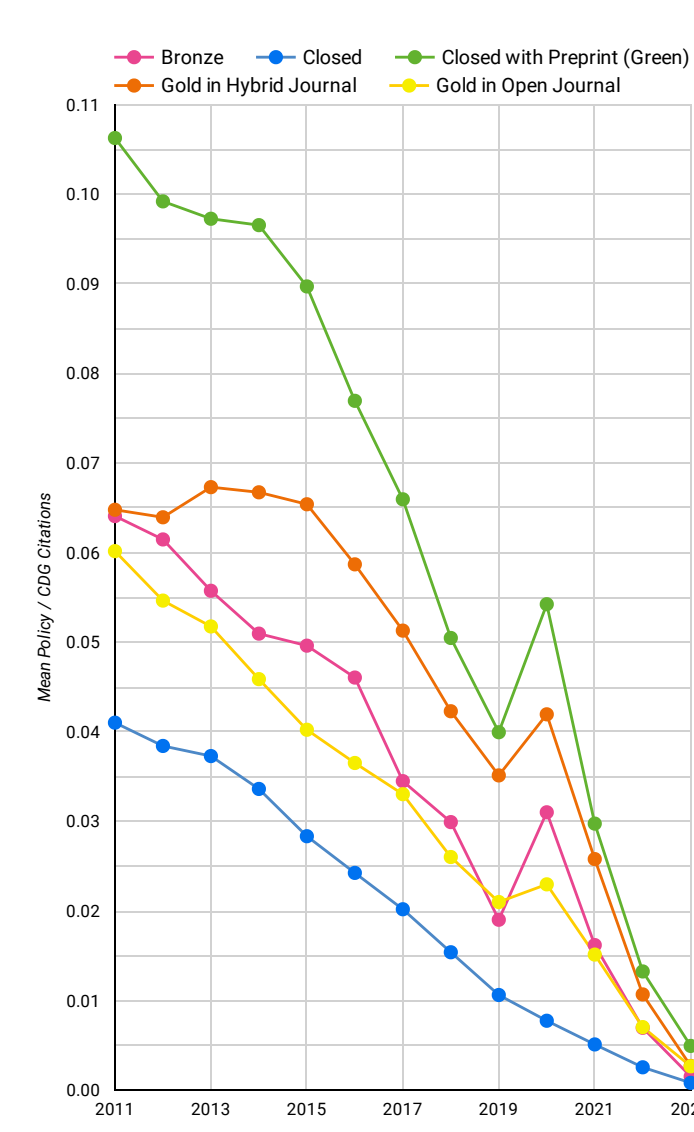
Growth in OA Medical publishing since 2011



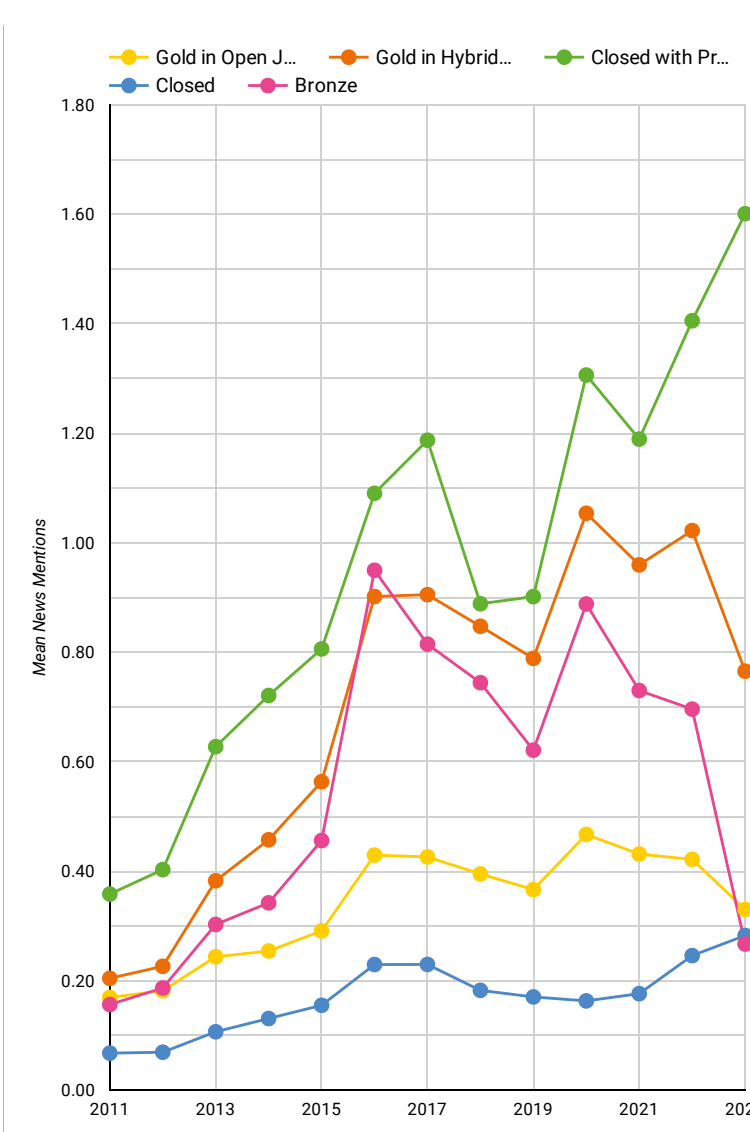
Changes in annual citations per year



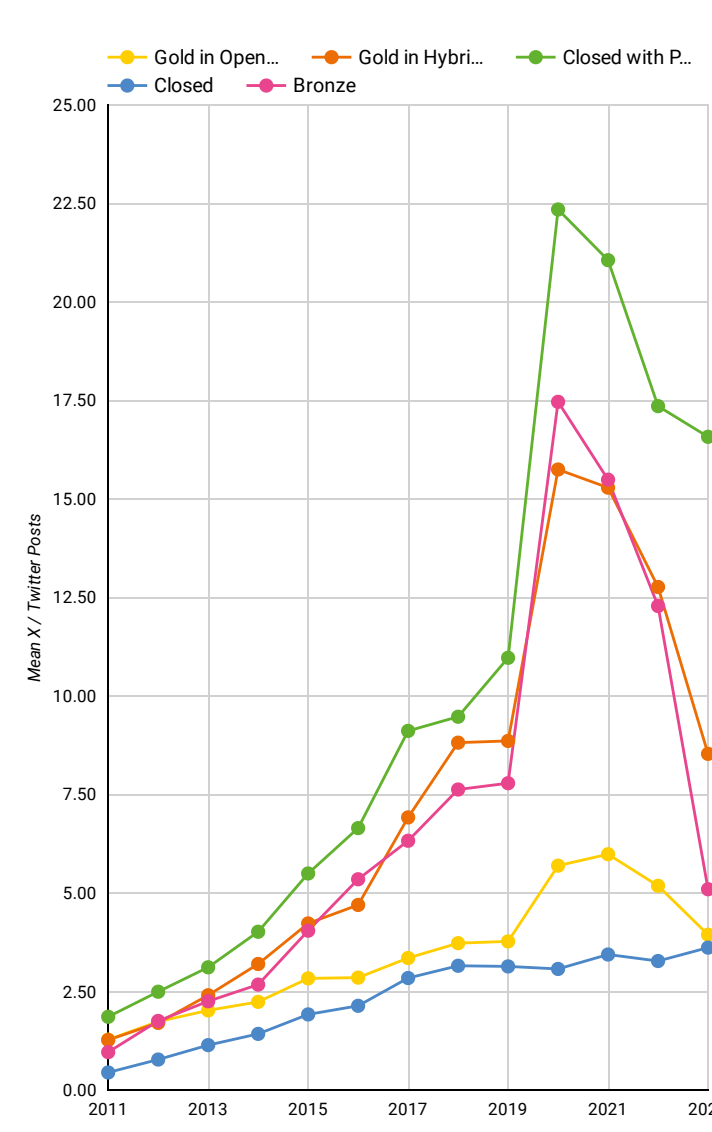
Changes in Policy/CDG mentions over time



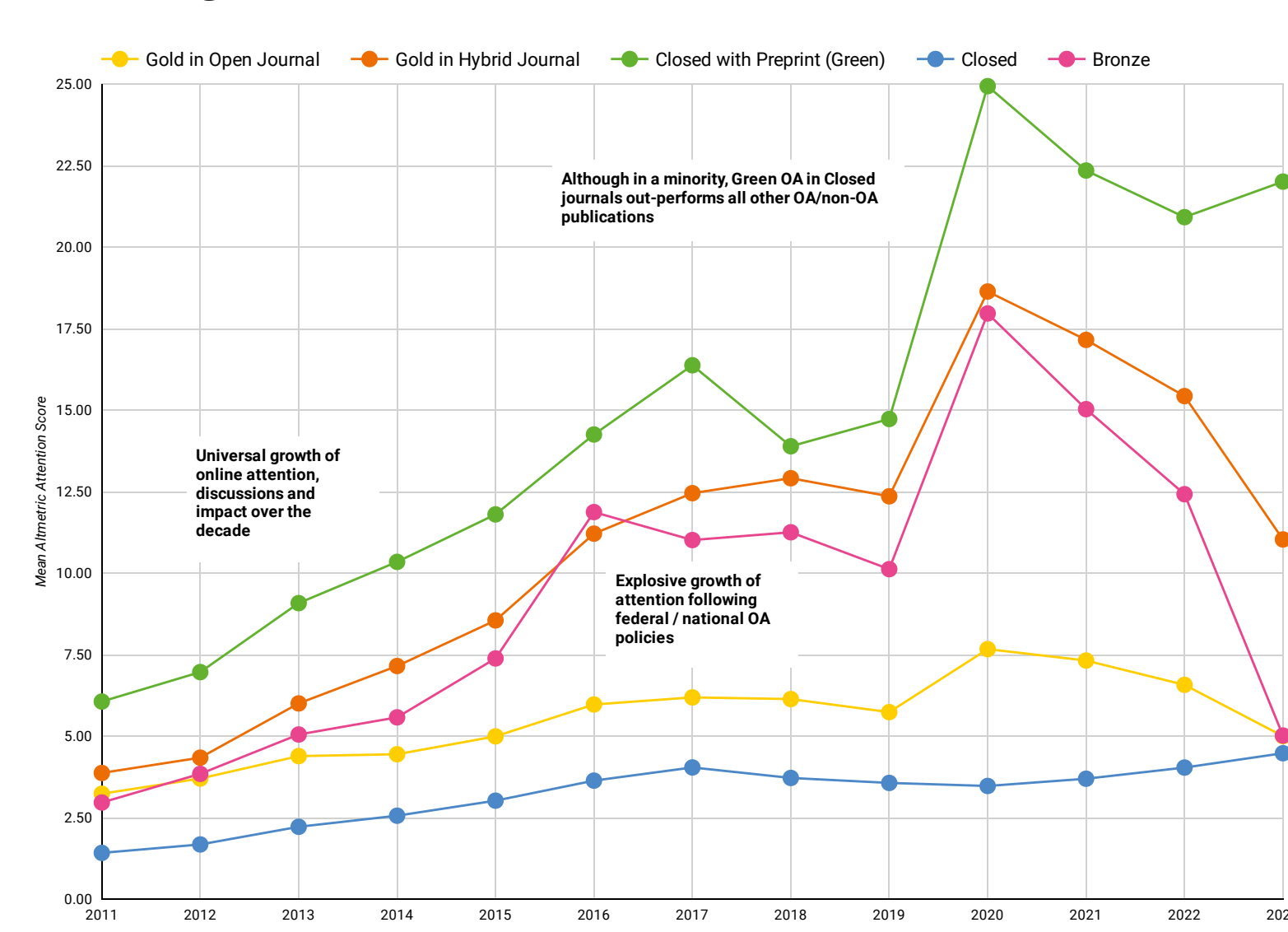
Changes in news mentions over time



Changes in Twitter/X mentions over time



Changes in Altmetric Score over time



Beall, J. (2015). *What the Open-Access Movement Doesn't Want You to Know*. American Association of University Professors. <https://www.aaup.org/article/what-open-access-movement-doesn%E2%80%99t-want-you-know>

Holmberg, K., Hedman, J., Bowman, T. D., Didegah, F., & Laakso, M. (2019). Do articles in open access journals have more frequent altmetric activity than articles in subscription-based journals? An investigation of the research output of Finnish universities. *Scientometrics*. <https://doi.org/10.1007/s11192-019-03301-x>

Taylor, M. (2023). Slow, slow, quick, quick, slow: five altmetric sources observed over a decade show evolving trends, by research age, attention source maturity and open access status. *Scientometrics*. <https://doi.org/10.1007/S11192-023-04653-1>

UNESCO. (2022). *Understanding open science*. <https://doi.org/10.54677/UTCD9302>

Woelfle, M., Oliaro, P., & Todd, M. H. (2011). Open science is a research accelerator. *Nature Chemistry* 2011 3:10, 3(10), 745–748. <https://doi.org/10.1038/nchem.1149>

Zhang, L., Wei, Y., Huang, Y., & Sivertsen, G. (2022). Should open access lead to closed research? The trends towards paying to perform research. *Scientometrics*, 127(12), 7653–7679. <https://doi.org/10.1007/S11192-022-04407-5/FIGURES/8>