OPEN SCIENCE MONITOR

Updated list of open access publications and social media indicators

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Open Access indicators

Open access to publications refers to the possibility to freely and legally access research publications. In the Open Science Monitor we have calculated the following indicators related to the proportion of Open Access publication for different units (temporal trend, countries and Fields of Science):

- **PP(closed):** proportion of publications of a unit of analysis (year, country or Field of Science) for which there is no evidence of Open Access (according to Unpaywall - https://unpaywall.org/).
- **PP(oa):** proportion of publications of a unit of analysis (year, country or Field of Science) for which there is evidence of Open Access availability, either Gold, Hybrid, Bronze and/or Green.
- **PP(oa gold):** proportion of gold open access publications of a unit of analysis (year, country or Field of Science). Gold open access publications are publications in an open access journal.
- **PP(oa hybrid):** proportion of hybrid open access publications of a unit of analysis (year, country or Field of Science). Hybrid open access publications are publications in a subscription journal that are open access with a clear license.
- **PP(bronze OA):** proportion of bronze open access publications of a unit of analysis (year, country or Field of Science). Bronze open access publications are publications in a subscription journal that are open access without a license.
- **PP(green OA)**: proportion of green open access publications of a unit of analysis (year, country or Field of Science). Green open access publications are publications in a journal that are also available in an open access repository.

The different types of open access are partially overlapping. A publication can be both green open access and gold, hybrid, or bronze open access. Overall, green open access can overlap with any of the other types of open access (gold, bronze or hybrid), but the later are mutually exclusive.

The general methodology applied in the calculation of these indicators is the same as applied in the Leiden Ranking [https://www.leidenranking.com/information/indicators]. An extended explanation of the philosophy behind the indicators and their technical discussion can be found in the following blog post [https://www.cwts.nl/blog?article=n-r2w2a4]. Our classification, based on the Unpaywall evidence is compliant with the proposal for classification proposed by Unpaywall [https://impactstory.freshdesk.com/support/solutions/articles/44001777288-what-do-the-types-of-oa-status-green-gold-hybrid-and-bronze-mean-], although we don't prioritize gold/hybrid/bronze over green and decided to report green open access independently of other forms of open access.

Social media indicators

In addition to the previous open access indicators, several new metrics related to the presence of open access (or closed) publications in social media have been reported. We have focused on tweet mentions, blog mentions, news media mentions to scientific publications recorded by PlumX [https://plumanalytics.com/].

Publications that have been mentioned at least once by each of these social media sources (i.e. Twitter, blogs, or news media) have been identified (we refer to them a **P(tw1)**, **P(bg1)** and **P(nws1)**). The distributions of these mentioned publications by typologies of open access have been measured through the following indicators:

- **PP(tw1 oa)**: proportion of the tweeted publications of a unit of analysis (year, country or Field of Science) that are open access.
- **PP(tw1 oa {gold, hybrid, bronze, green}):** proportion of the tweeted publications of a unit of analysis (year, country or Field of Science) that are open access {gold, hybrid, bronze, green}.
- **PP(bg1 oa)**: proportion of the blogged publications of a unit of analysis (year, country or Field of Science) that are open access.
- **PP(bg1 oa {gold, hybrid, bronze, green}):** proportion of the blogged publications of a unit of analysis (year, country or Field of Science) that are open access {gold, hybrid, bronze, green}.
- **PP(nws1 oa)**: proportion of the publications mentioned in news media of a unit of analysis (year, country or Field of Science) that are open access.
- **PP(nws1 oa {gold, hybrid, bronze, green}):** proportion of the publications mentioned in news of a unit of analysis (year, country or Field of Science) that are open access {gold, hybrid, bronze, green}.

In addition to the above, the overall numbers of social media events (i.e. the share of total tweets/blog/news mentions) that mention different types of open access (or closed) publications have also been calculated. The following indicators are also obtained:

- **P(tws closed)**: Proportion of tweets to closed publications (i.e. the share of all tweets that go to closed publications).
- **P(tws oa)**: Proportion of tweets to OA publications (i.e. the share of all tweets to publications that go to open access publications). Notice that P(tws closed) and P(tws oa) mirror each other.
- **P(tws oa {gold, hybrid, bronze, green})**: Proportion of tweets to OA {gold, hybrid, bronze, green} publications.
- **P(blogs closed)**: Proportion of blog mentions to closed publications (i.e. the share of all blog mentions that go to closed publications).
- **P(blogs oa)**: Proportion of blog mentions to OA publications (i.e. the share of all blog mentions that go to open access publications). Notice that P(blogs closed) and P(blogs oa) mirror each other.
- **P(blogs oa {gold, hybrid, bronze, green})**: Proportion of blog mentions to OA {gold, hybrid, bronze, green} publications.
- **P(news closed)**: Proportion of news mentions to closed publications (i.e. the share of all news mentions that go to closed publications).
- **P(news oa)**: Proportion of news mentions to OA publications (i.e. the share of all news mentions that go to open access publications). Notice that P(news closed) and P(news oa) mirror each other.
- **P(news oa {gold, hybrid, bronze, green})**: Proportion of news mentions to OA {gold, hybrid, bronze, green} publications.

Readership metrics by OA typologies

The only saving patterns of publications in the online reference manager Mendeley have been studied in what is commonly known as Mendeley readership [link here to: https://www.metrics-toolkit.org/mendeley-readers/]. The following indicators are calculated:

- **P(trs closed)**: Proportion of total readership to closed publications (i.e. share of the accumulated number of total Mendeley users that have saved closed publications in their libraries).
- **P(trs oa)**: Proportion of total readership to that go to OA publications (i.e. share of the accumulated number of total Mendeley users that have saved OA publications in their libraries). Note that P(trs closed) and P(trs oa) mirror each other.
- **P(trs oa {gold, hybrid, bronze, green}):** Proportion of total readership to that go to OA {gold, hybrid, bronze, green} publications (i.e. share of the accumulated number of total Mendeley users that have saved OA {gold, hybrid, bronze, green} publications in their libraries).