



Open Access

In open access (OA), the author(s) or the publisher of a publication (the rights owner) provides users with free access to use, distribute, transmit, or display the intellectual work. This sidebar summarizes research on the evolving nature of OA, potential impacts to publication models, measurement of OA, and preliminary results assessing the share of U.S. and global publications available in OA.* OA is spreading rapidly as high-speed Internet provides a useful platform for posting and accessing scholarly research.

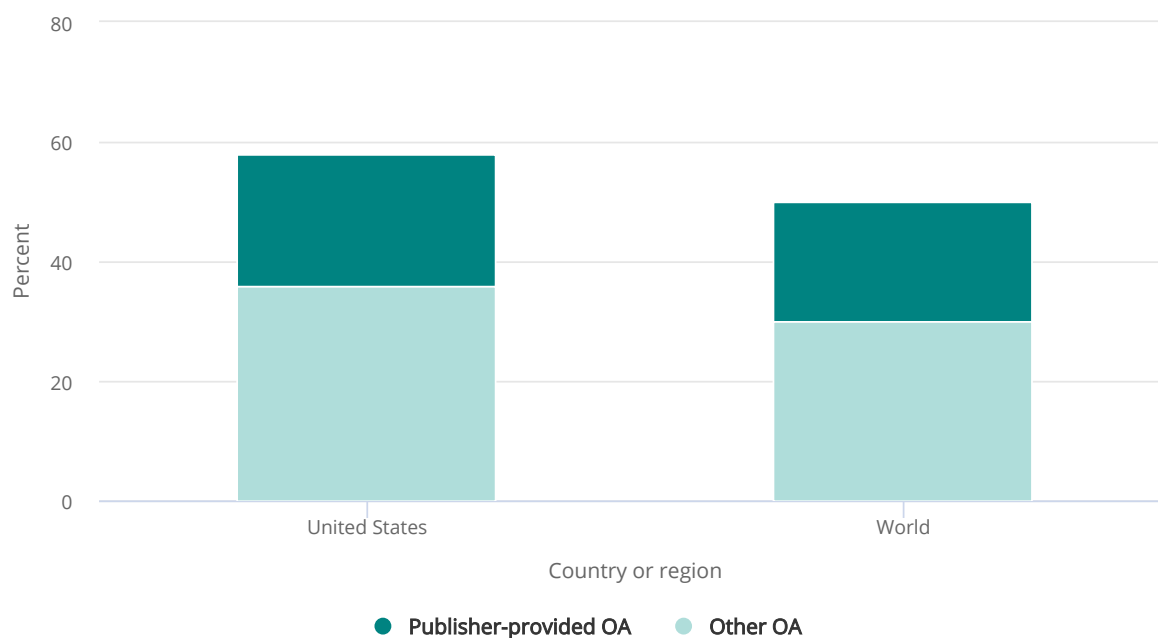
Driving the shift, major research funders and governments increasingly require expanded or free access to the research output they support. For example, in 1998, Brazil established SciELO (Scientific Electronic Library Online) with a goal of improving and expanding dissemination and accessibility of Latin American and Caribbean scientific publications. Since then, 16 other countries in South America, Central America, and Europe have joined. In 2013, the U.S. Office of Science and Technology Policy issued a memorandum, "Increasing Access to the Results of Federally Funded Scientific Research," prompting the majority of agencies, including NSF, to require investigators to make peer-reviewed journal articles that result from federally funded research publicly available not more than 1 year after their official date of publication.

A recent study by Science-Metrix (Science-Metrix 2017c), corroborated by a European Commission study (Archambault et al. 2014), found that nearly 60% of U.S. publications and about 50% of the publications produced worldwide have become available in OA, as shown in Figure 5-A. This may undercount the true levels of OA, according to Science-Metrix, which performed additional manual validation on a random sample of 1,000 articles. They found the percentage of OA for 2010–14 to be nearly 70% for the United States and just under 60% for the rest of the world.

OA publications are becoming available in a dynamic environment where more material becomes available every day, including new papers coming online shortly or immediately after publication and older papers coming online months after their initial publication following an initial embargo period or as part of a general movement to make older papers freely available. Many venues provide online access to scholarly publications, including publisher and researcher websites, and institutional and subject-specific repositories. As Figure 5-A shows, around the world about 40% of the time publishers provide the OA (often known as "gold OA"), whereas about 60% of the time another source, such as the researcher or his or her institution, provides the access (often known as "green OA"). The green-gold distinction is complicated because although many publications available online are posted legally, some are not. A variety of rights and licensing agreements makes it difficult to assess the legality of postings across the broad diversity of websites.[†]

FIGURE 5-A 

Share of publications available in publisher-provided open access and total open access: 2006–15



OA = open access.

Note(s)

Results are computed using full counting. Other OA includes access provided by the researcher or institution and about 15% of OA publications for which the provider was not identified. Total OA shows relative magnitude only.

Source(s)

Science-Metrix; Clarivate Analytics; 1science, accessed November 2016.

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The OA environment challenges the preexisting publication business model, where library and users’ subscription fees supported publications and peer review for robustness and originality. In the OA business model, publication costs are often paid by the author or institution. This shift in payment structure challenges researchers to find funds to cover publication fees.

Trends

U.S. OA Publications

As of early 2017, over 50% of U.S. publications from 2006 were available in OA, increasing steadily to over 60% for publication years 2010–14 and then dropping back to 52% for 2015 (Figure 5-B). Lower OA levels for the most recent publication year reflect a common phenomenon of OA: many licensing arrangements contain a provision for an embargo period (often 6–18 months) after initial publication, during which the publisher retains exclusive rights for paid distribution and after which the publications can be distributed more widely for free.

FIGURE 5-B

Annual percentage of U.S. publications available in publisher-provided open access and total open access: 2006–15



OA = open access.

Note(s)

Data are presented according to publication year. Results are computed using full counting. Other OA includes access provided by the researcher or institution and about 15% of OA publications for which the provider was not identified. Total OA shows relative magnitude only.

Source(s)

Science-Metrix; Clarivate Analytics; 1science, accessed November 2016.

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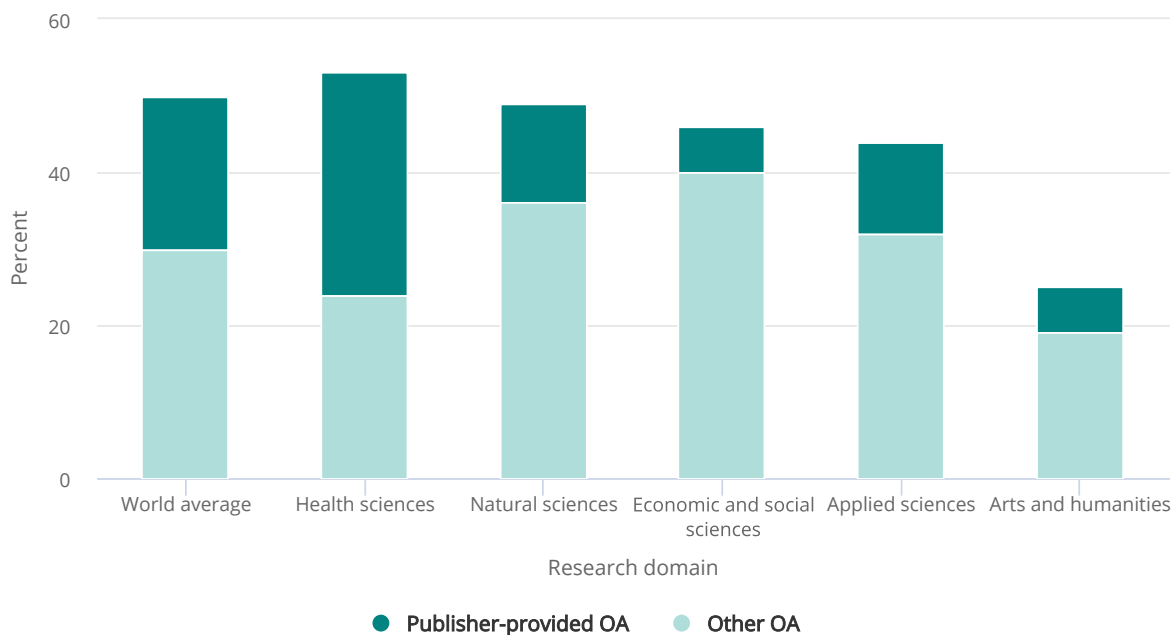
Across Fields

The levels of publisher-provided and total OA vary across research fields (note that the research fields presented in this sidebar are those used in the Web of Science database and are slightly different from those used in other sections of this chapter). The health sciences field has the highest share of OA publications for publisher-provided OA (29%) and total OA (53%) (Figure 5-C). Some 46% of economics and social sciences publications are available in total OA, but only 6% of papers are provided in OA by the publisher specifically. The domain of arts and humanities has the lowest share of publications available in total OA (25%), although the level of publisher-provided OA in this field is similar to levels for economics and social sciences (6%).

The trend toward more and more articles moving to OA is expected to continue as funding organizations increasingly require free access for research results.

FIGURE 5-C

Percentage of publications available in publisher-provided open access and total open access, by research domain: 2006–15



OA = open access.

Note(s)

Data are presented according to publication year. Results are computed using full counting. Other OA includes access provided by the researcher or institution and about 15% of OA publications for which the provider was not identified.

Source(s)

Science-Metrix; Clarivate Analytics; 1science, accessed November 2016.

Science and Engineering Indicators 2018

* This sidebar reports levels of OA that were assessed by matching the content of a database of OA papers produced by 1science to the Web of Science bibliometric database (produced by Clarivate Analytics; formerly produced by Thomson Reuters).

† For a discussion of the legal complexities, see “Steady, strong growth is expected for open-access journals,” *Physics Today*, <http://physicstoday.scitation.org/doi/10.1063/PT.3.3550>, accessed 30 May 2017.