The Open Access Policy Citation Advantage for a Medical School

October 14, 2020

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ABSTRACT

The open access citation advantage has been studied across several disciplinary and in large, multidisciplinary analyses. The potential citation advantage of making an article open access (OA) may be a contributing factor to the increasing number of universities where faculty have adopted OA policies. If authors participate in these policies, one might expect an increase in citations to works authored at OA policy institutions. Do OA policies increase citation rates for a medical school? This study seeks to answer that question by measuring the comparative citation impact of articles made OA by Indiana University School of Medicine (IUSM) authors in the implementation of an OA policy (OAP).

Methods: We use a random selection of articles by IUSM faculty from 2016 to compare the citation profiles of OA policy articles to paywalled articles. We used two sources to count citations received from 2016 to the present, Web of Science (WoS) and Google Scholar (GS).

Results: IUSM OA Policy 2016 articles receive 63% (GS) - 72% (WoS) more citations than do paywalled articles across nearly five years of citations. The citation advantage of OAP articles is also reflected in an 18% (GS) - 33% (WoS) increase in the median citation rate.

Conclusion: The Indiana University Purdue University Indianapolis (IUPUI) OA Policy was adopted in October 2014 and fully implemented beginning with the year 2016. Annually, a majority of the articles authored by IUPUI faculty (inclusive of the School of Medicine) are made openly available in the institutional repository. The benefits of this policy to the public include free access to scholarly information. If the benefits to the authors and to the institution include an increase in citation rates, other institutions may wish to explore OA policy adoption.

INTRODUCTION

The IUPUI Open Access policy (https://openaccess.iupui.edu/) is a Harvard-model, rights retention, opt out policy. By adopting the policy, the faculty retain copyrights to their scholarly articles and grant permission to the university to openly archive a version of those articles in the institutional repository, IUPUI ScholarWorks. Authors that do not wish to exercise these rights or authors that wish to publish in venues with conflicting copyright agreements, may choose to opt out. By implementing the policy, the libraries have made more than 12,000 articles openly accessible in IUPUI ScholarWorks--roughly half of these articles were authored by faculty affiliated with the IU School of Medicine (IUSM). In recent years ~70% of IUPUI's annual number of articles are made openly accessible from the institutional repository. If an article is already OA, the work is archived on behalf of the author; if a "legal" OA version cannot be found, the authors receive a notification requesting participation in the policy. In 2018 only 3% of articles resulted in a direct request to opt out.[1]

The Open Access Citation Advantage (OACA) has been examined across several disciplinary and in large, multidisciplinary analyses. Many of these studies have found greater citation impact for open access (OA) articles compared to toll-access ones. An oft-cited, large-scale analysis by Piwowar et al, for example, found OA articles receive 18% more citations than average (when accounting for age and discipline), which corroborates OACA findings from earlier reports.[2]

OACA has also been confirmed in studies examining the citation impact of universities with institutional OA policies. Young & Brandes found green (institutional repository) OA articles published by faculty at the College of Tropical Agriculture and Human Resources at the University of Hawaii at Manoa received up to 106% more citations on average than gold (publisher provided) OA or non-OA articles.[3] De Filippo & Mañana-Rodríguez also determined green OA publications from members of the Young European Research Universities Network (YERUN) had greater citation impact than other types of OA and non-OA publications.[4]

These investigations into the OACA for institutional OA policies are very recent. Our presentation contributes to this work by examining the citation impact of articles from a medical school with an institutional OA policy.

METHODS

For this study we selected the publication year of 2016 instead of a more recent year because citation rates may not mature for several years. A total of 2,270 articles were openly archived in IUPUI ScholarWorks in 2016. Of these, 1,617 articles were authored by IUSM faculty members. Some of these articles were OA already--for example, they were retrieved from OA journals or from PubMed Central (PMC). To better understand the direct impact of the OA policy, we identified a subset of articles that would *not* have been made OA without the implementation of the policy. We also ran a Web of Science (WoS) affiliation search [OG=(Indiana University-Purdue University Indianapolis)] for IUPUI articles from 2016. Unfortunately, for our study, WoS does not provide an "Organization-Enhanced" (OG) affiliation search for IUSM. In WoS OG searches, the IU School of Medicine is a subset of IUPUI.

Creating the Samples: We used OpenRefine to isolate the IUSM articles and used R to cross-check this list of articles against OA policy data for 2016. In this way were were able to create two data sets--a list of paywalled, IUSM articles and a list of IUSM articles made OA as a direct result of the IUPUI OA policy. From these we created two random samples of 50 articles each.

Citation Counts: We used two sources to count citations to the articles in our samples, Web of Science and Google Scholar. Users can include citation counts when exporting records from WoS; thus, for our study, these counts were readily supplied while building the data samples (August 24, 2020). We decided to include Google Scholar citation counts not for the purpose of comparing Google Scholar with Web of Science, but to confirm that differences between the citation profiles of the two samples did not depend on the source of citation counts. Google Scholar citation counts were recorded manually (October 5-6, 2020).

RESULTS

A Web of Science search for IUPUI "articles" shows very little change in the average number of citations that articles receive within the first two years of publication.
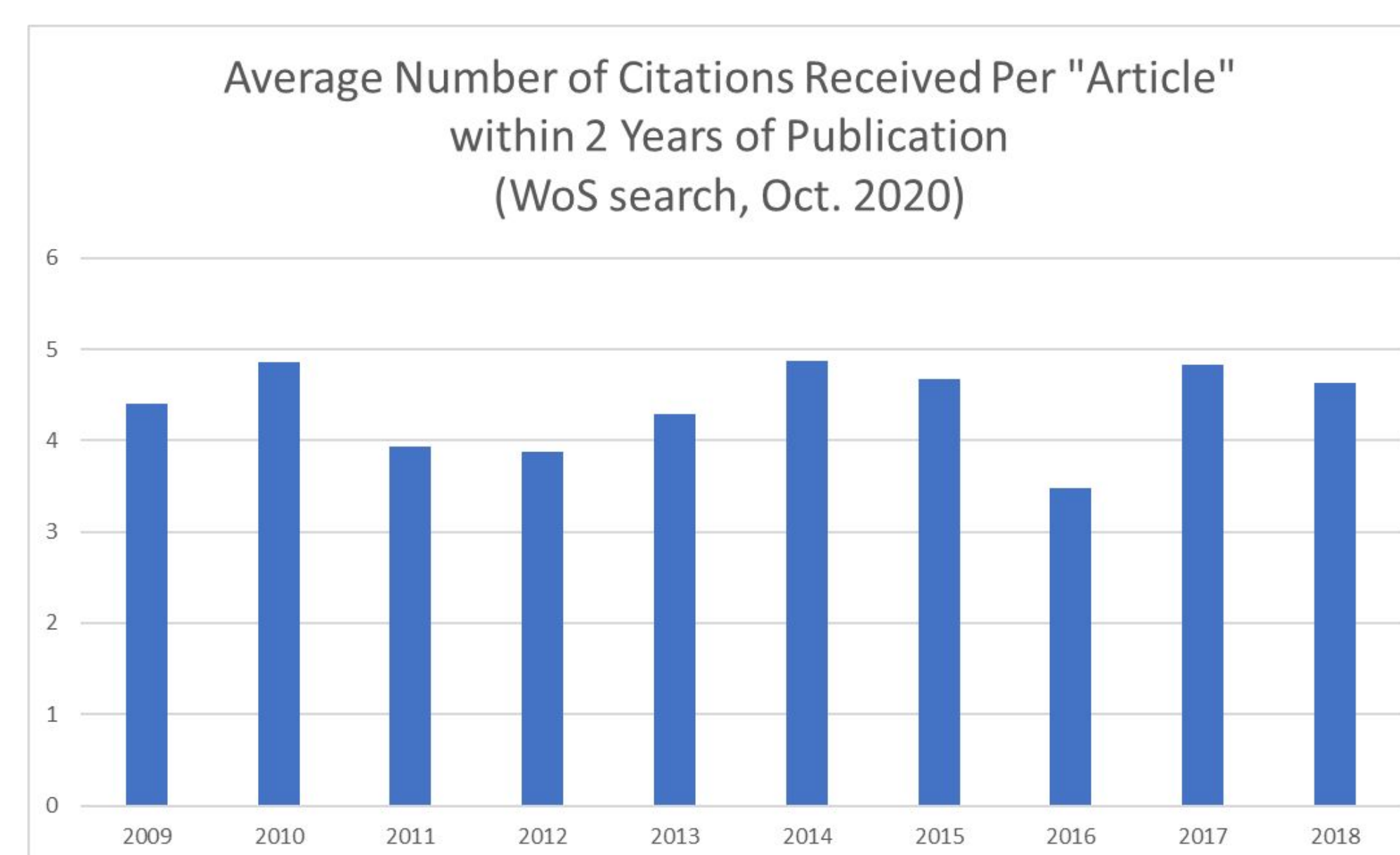

Figure 1. Articles by publication year and average number of citations received per article within two years, 2009-2018. Averages range between 3 and 5 citations per article.

This measure, however, may not be sensitive enough to show the impact of the IUPUI Open Access Policy on the citation rates for IUSM authors. Works are sometimes made open access one to two years after publication. Thus, the resulting citation impact would need a longer window. For this study, we choose the year 2016 for a nearly five year picture of citation impact. The year 2016 was also the first year that the IUPUI OA Policy was fully implemented (nearly all IUPUI authors of paywalled articles received a notification about those articles in 2016). Therefore, 2016 also provides of a better measure of the early impact of the policy.

	Articles (WoS)	Total WoS Citations	WoS Avg Citations Per Article	WoS Median Citations Per Article	Google Scholar Citations	Google Scholar Avg Citations Per Article	Google Scholar Median Citations Per Article
IUPUI 2016	1,700	24,777	14	7			
IUSM (partial subset)	576	10,322	17.9	9			
IUSM Paywalled Sample	50	448	9.76	6	793	15.86	11
IUSM OAP Sample	50	771	15.42	8	1,293	25.86	13

Table 1. Citations received (WoS 2016 - Aug 24, 2020), (GS 2016 - Oct 6, 2020), average citations per article, and median citation per article
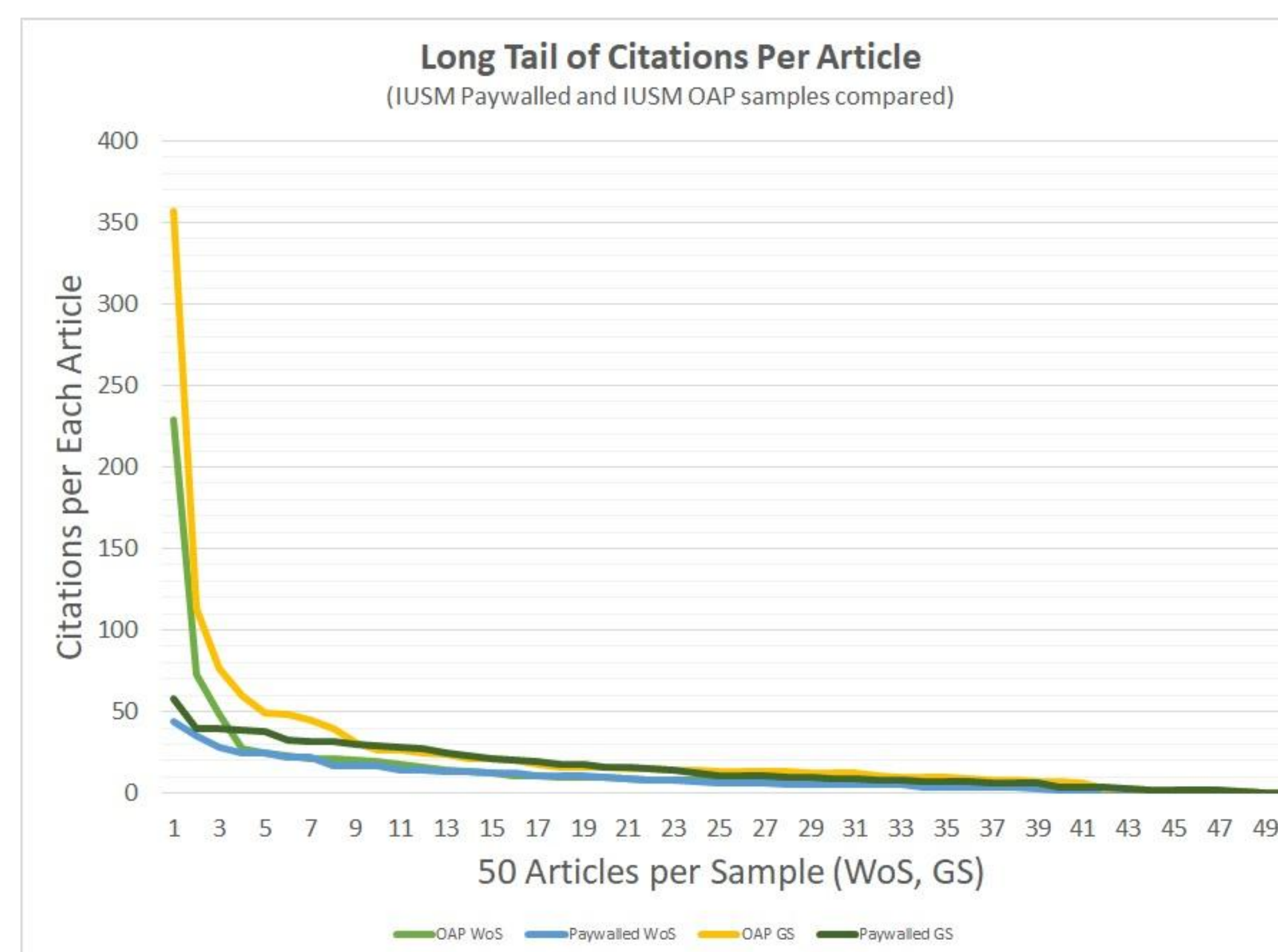

Figure 2. Citations received (WoS 2016 - Aug 24, 2020), (GS 2016 - Oct 6, 2020) for each article in the two samples. The OAP citation advantage is skewed. The more-cited articles reap greater benefits from the OAP than do the lesser-cited articles.

In comparing the citation rates between these two samples from 2016, IUSM OA policy (OAP) articles receive more citations than do paywalled articles across nearly five years citations (Table 1). The comparison using Web of Science showed a citation increase of 72% for OAP articles. Using Google Scholar for citation tracking, showed an increase of 63% for OAP articles. The citation advantage of OAP articles is also reflected in increases in the median citation rate: 33% for WoS and 18% for GS. These findings are similar to those reported in prior studies of general OA citation advantage.

DISCUSSION

We found evidence that the IUPUI Open Access Policy has increased the citation rates of articles authored by IU School of Medicine faculty members. While this increase definitely contributed to a general increase in citations to the school's citation profile, we are unsure to what degree. We looked at a sample of articles that would not have been OA but for the implementation of the OA policy. There are many more IUSM articles that were either published in OA journals or made OA in other repositories, such as PMC. We also found, as have other studies of citation measures, that the citation advantage for OAP articles is skewed (Fig. 2). In other words, the citation-rich get richer as a result of participating in self-archiving or green open access initiatives.

Limitations: Our study looked at the OAP citation advantage for articles within one medical school at one university. To better understand the citation advantages at the organizational level, we could compare IUSM's citation rates to other, similar medical schools that do not currently have an institutional OA policy. We also limited our analysis to two samples of 50 articles each. We are unsure how increasing our sample size might change the results.

Conclusions: Other universities with a medical school that are thinking about ways to increase the readership and influence of their scholarship may wish to consider the experience of IUSM's participation in the OA policy. In the six years that IUSM authors have participated in the policy, no publishers have refused to publish an article and no copyright complaints have been reported. On the other hand, many readers receive free, open access to important scholarship while IUSM authors benefit from increased readership and greater citations counts. There are other benefits (such as an increased understanding of issues in scholarly communication) to discussing OA policy adoption at the department, school, or institution level. IUPUI is a member of the Coalition of Open Access Policy Institutions (COAPI); we recommend contacting COAPI (https://sparcopen.org/coapi/) as a first step for learning more about OA policies.

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