

INTERNATIONAL JOURNAL OF  
**GYNECOLOGICAL CANCER**

**Evaluating Open Access Publication and Research Impact in  
Gynecologic Oncology**

Journal:	<i>International Journal of Gynecological Cancer</i>
Manuscript ID	ijgc-2023-004460
Article Type:	Original research
Date Submitted by the Author:	14-Mar-2023
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Keywords:	Surgical Oncology < Surgery

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Manuscripts

1 Evaluating Open Access Publication and Research Impact in Gynecologic Oncology  
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28

29 Abstract

30 **Objective**

31 To evaluate whether a citation advantage exists for open access (OA) publications in  
32 gynecologic oncology.

33 **Method**

34 A cross-sectional study of research and review articles published in the *International Journal*  
35 *of Gynecological Cancer (IJGC)* and in *Gynecologic Oncology* during 1980-2022.

36 Bibliometric measures were compared between OA publications and non-OA publications.

37 The role of authors in low/middle income countries was assessed. We analyzed article  
38 characteristics associated with a high citations per year (CPY) score.

39 **Results**

40 Overall, 18,515 articles were included of which 2,398 (13.0%) articles were published OA.

41 During 2018-2022, the average proportion of articles published OA was 34.0% (range;

42 28.5%-41.4%). OA articles had higher CPY (median [IQR], 3.0 [1.5-5.3] vs. 1.3 [0.6-2.7],

43  $p < 0.001$ ). There was a strong positive correlation between OA proportion and impact factor;

44 *IJGC* –  $r(23) = .90$ ,  $p < .001$ , *Gynecologic Oncology* –  $r(23) = .89$ ,  $p < .001$ . Articles by authors

45 from low/middle income countries were less common among OA articles compared to non-

46 OA articles (5.5% vs. 10.7%,  $p < 0.001$ ). Articles by authors from low/middle income countries

47 were less common in the high CPY group compared to articles without a high CPY score

48 (8.0% vs. 10.2%,  $p = 0.003$ ). The following article characteristics were found to be

49 independently associated with a high CPY: publication after 2007, (adjusted odds ratio [aOR]

50 4.9, 95% confidence interval [CI] [4.2-5.7]), research funding reported (aOR 1.6, 95% CI 1.4-

51 1.8), and being published OA (aOR 1.4, 95% CI 1.2-1.6). Articles written by authors in

52 Central/South America or Asia had lower odds of having high CPY (Central/South America,

53 aOR 0.4, 95% CI 0.2-0.8; Asia, aOR 0.5, 95% CI 0.4-0.7).

54 **Conclusion**

55 OA publishing in the subscription-based gynecologic oncology journals, has increased

56 substantially over the most recent two decades and rticles written by authors in low/middle

57 income countries are underrepresented among OA publications.. An article's OA status is  
58 independently associated with bibliometric scores.

59 **Key words:** bibliometrics, citation, income level, open access, subscription.

60

61 **What is already known on this topic –**

62 In some research fields, articles published open access are cited more than comparable  
63 articles published under a subscription model.

64 **What this study adds –**

65 Open access publishing in subscription-based gynecologic oncology journals has increased  
66 and is independently associated with bibliometric measures of academic impact. Articles  
67 written by authors in low/middle income countries are published less in an open access  
68 model.

69 **How this study might affect research, practice or policy –**

70 Journals that weigh possibilities to change to open access models should include our results  
71 in their considerations. It would be important to study the role of open access in other  
72 journals as well and perhaps finding means for equality in open access for low/middle  
73 income countries' authors.

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## 82 **Introduction**

83 Publishing original medical research has traditionally relied on authors who provide a  
84 journal's content and on editors and peer reviewers who perform the review and processing  
85 of such work. Historically, publishers relied on paid subscriptions to cover journal production  
86 costs. Despite hopes that online electronic publishing would be less expensive to produce[1],  
87 increasing journal subscription prices outpaced university libraries budgets, leading them to  
88 cancel subscriptions[2, 3]. Open access (OA) publishing emerged as a response to  
89 subscription-based publishing's paired problems of rising journal production costs and  
90 decreased access to research[4, 5].

91 OA is a model of publishing in journals in which the full text of articles can be freely  
92 accessed, as the publishing is funded through means other than subscriptions, most  
93 commonly articles process fees. Proponents of OA believe that it promotes wider distribution  
94 of research while also removing barriers to accessing it. Alongside with being an initiative  
95 with the intent of decreasing the costs of publication/subscription and improving scientific  
96 communication[6-8]. On the other hand, the article processing charges required for OA  
97 publishing may be prohibitively expensive, especially for authors from low or middle income  
98 countries[9].

99 In some research fields, articles published in OA seem to have a 'citation advantage' as they  
100 can be cited more often than comparable articles published under a subscription model. No  
101 investigation has evaluated if a citation advantage exists for OA publication in gynecologic  
102 oncology research. Our goal was to assess for an association between OA publication and  
103 citation impact, hypothesizing that articles published OA would have higher citation impact.

104

## 105 **Methods**

106 This was a cross-sectional study. We performed a search using Web of Science, a collection  
107 of large, online databases of bibliographic information of scientific publications. We initially  
108 included all articles that were published in the *International Journal of Gynecological Cancer*  
109 (*IJGC*) or *Gynecologic Oncology* from the year each journal adopted an Open Access policy

110 (*IJGC*, 1992; *Gynecologic Oncology*, 1980) until the present. We excluded all publications  
111 that were not either original research or review articles as categorized by Web of Science.  
112 For each journal, Web of Science was queried to generate a list of all publications. From  
113 Web of Science, we collected: article title, author list, corresponding author, OA license,  
114 funding support for the research described, and the usage count (the number of times an  
115 article's full text of a record has been accessed or saved) since 2013. We collected historical  
116 impact factors of both journals as well.

117 We categorized the articles identified as OA or non-OA. The OA status of each article was  
118 ascertained from the Web of Science database. This database classifies OA articles into  
119 different OA license types. For the purpose of this analysis, we defined articles in our sample  
120 as OA if they were published under any OA license (including those that were free of charge  
121 by the journals).

122 Bibliometric variables were abstracted from the National Institutes of Health (NIH) iCite  
123 database, a database maintained by the NIH Office of Portfolio Analysis used to evaluate the  
124 impact over time of the scientific research it has supported. From iCite, we collected:  
125 citations per year (CPY) (the average number of annual citations); relative citation ratio (the  
126 number of citations an article receives relative to a comparison group within the same field);  
127 field citation ratio (the number of citations an article has received divided by the average  
128 number received by other publications in the same year and same research field).

129 We defined the country of origin based on the country in the address of the corresponding  
130 author. When such was not available (n=6), we used the location of the first author's  
131 institution as listed in the publication. Country of origin was classified by geographic region  
132 (Africa, Asia, Central/South America, Europe, North America, and Oceania) and by income  
133 status (high vs. low/middle income country) as defined by the World Bank[11].

134

### 135 *Statistical analysis*

136 All data were gathered and analyzed in October 2022. The primary outcome measure was  
137 CPY in OA vs. non-OA groups. We used descriptive statistics to summarize the proportion of

138 OA articles. We performed Chi-square (or Fisher's exact when appropriate) tests to compare  
139 the OA group vs. non-OA group in different categories of each characteristic. We used  
140 Mann–Whitney U test to compare continuous variables. We performed univariable and  
141 multivariable logistic regression analyses to identify article characteristics associated with  
142 high CPY (defined as articles with CPY  $\geq 90^{\text{th}}$  percentile of the entire cohort). The  
143 multivariable analysis included the variables that were statistically significant during  
144 univariable analysis. We performed a ROC analysis to identify a cutoff value for publication  
145 year to differentiate between high CPY and normal CPY groups. That cutoff point (2007) was  
146 entered into the regression analysis. For all statistical analyses, a two-sided  $P < 0.05$  was  
147 used as the criterion for statistical significance. We performed Spearman's rank correlation  
148 test to analyze the correlation between OA percentage of publications in each year and the  
149 impact factor of the journal in the same year. All analyses were conducted using SPSS 28  
150 (SPSS Inc., Chicago, IL). Institutional review board approval was not required as the study  
151 used publicly available datasets and does not involve individual patient data.

152

### 153 **Results**

154 A total of 18,515 articles were included in the analysis (*IJGC*, 29.2% [5,408/18,515];  
155 *Gynecologic Oncology*, 70.8% [13,107/18,515]). Figure 1 present the rate of OA publications  
156 by year during the study period for each journal separately. Since the first OA article was  
157 published in either journal, 13% (2,398/18,515) of articles were published OA (*IJGC*, 12.1%  
158 [655/5,408]; *Gynecologic Oncology*, 13.3% [1,743/13,107]). During the most recent five  
159 years, the average proportion of articles published OA was 34.0% (percent range per year,  
160 28.5%–41.4%). The proportion of publications supported by funding was higher in OA group  
161 vs, non-OA group. (77.9% [1,868/2,398] vs. 20.1% [3,243/16,117],  $p < 0.001$ ) (Table 1).  
162 Geographic differences in authorship were seen between the OA articles and non-OA  
163 articles (Table 1). There was higher proportion of articles by authors from North America in  
164 the OA group than non-OA articles (Table 1).

165

166 Compared to non-OA articles, OA articles had higher median CPY (median [IQR], 3.0 [1.5-  
167 5.3] vs. 1.3 [0.6-2.7],  $p<0.001$ ) (Table 1). The OA articles had a higher median relative  
168 citation ratio (median [IQR], 0.9 [0.5-1.8] vs. 0.7 [0.3-1.3],  $p<0.001$ ) and field citation ratio  
169 (median [IQR], 6.1 [4.8-7.4] vs. 4.4 [3.2-5.8],  $p<0.001$ ). The total number of citations was  
170 higher in the non-OA group (median citation count [IQR], 18 [8-35] vs. 14 [6-31],  $p<0.001$ ).  
171 A total of 1,858 (10.0%) publications were by authors in low/middle income countries (*IJGC*,  
172 20.6% [1,112/5,408]; *Gynecologic Oncology*, 5.7% [746/13,107]). Overall, the proportion of  
173 all publications by authors in low/middle income countries during the last decade has  
174 declined from a peak of 14.5% [96/661] in 2012 to 9.3% [31/333] in 2022 ( $p<0.001$ ) (Figure  
175 2). Articles in the OA group were less likely to be written by authors in low/middle income  
176 countries compared to articles in the non-OA group (5.5% [132/2,398] vs. 10.7%  
177 [1,726/16,117],  $p<0.001$ ) (Table 1). During the last decade, the proportion of publications by  
178 authors in low/middle income countries in OA publications has increased from 0.8% in 2012  
179 to 8.5% in 2022 while their proportion in non-OA group has declined from 17.8% to 9.7%,  
180  $p<0.001$  (Figure 3).

181 Table 2 presents comparison of articles with a CPY above the 90<sup>th</sup> percentile ( $n=1,801$ ;  
182 median CPY, 7.7 [IQR 6.4-10.7]) vs. less than the 90<sup>th</sup> percentile ( $n=16,146$ ; median CPY,  
183 1.3 [IQR 0.6-2.4]). Total number of citations, publication year, and OA status were positively  
184 associated with high CPY. Relative to the proportion of non-OA articles written by authors in  
185 low/middle income countries, publications by these authors were underrepresented among  
186 high CPY articles (8.0% [144/1,801] vs. 10.2% [1,643/16,146],  $p=0.003$ ). Comparing high  
187 CPY articles to all other articles, the proportion of articles written by authors in various  
188 regions differed ( $p<0.001$ ). Among high CPY articles compared to all other articles, North  
189 American authorship was more common (55.9% [1,007/1,801] vs. 47.8% [7,724/16,146]).  
190 Among articles with CPY <90<sup>th</sup> percentile, African, Central/South American, and Asian  
191 authorship was relatively more common, although these still made up a minority of articles.  
192 Using multivariable regression, the variables found to be independently associated with high  
193 CPY were: publication after 2007 (adjusted odds ratio [aOR] 4.9 [95% CI 4.2-5.7]), research



194 funding reported (aOR 1.6 [95% CI 1.4-1.8]), and OA status (aOR 1.4, [95% CI 1.2-1.6]).  
195 Articles written by authors in Central America, South America, and Asia had lower odds of  
196 being in the high CPY group.

197 The correlation between OA-publication proportion in each year and the impact factor of the  
198 same journal are presented in Figures S1-S2. There was a strong positive correlation  
199 between OA proportion and IF; *IJGC* –  $r(23)=.90$ ,  $p<.001$ , *Gynecologic Oncology* –  
200  $r(23)=.89$ ,  $p<.001$ .

## 201 **Discussion**

### 202 *Summary of main results*

203 In gynecologic oncology research, we found that OA publication has become gradually more  
204 common since its adoption. Over the last 5 years, 34.0% of articles published in two major  
205 gynecologic oncology journals were published OA. Articles published OA tended to have  
206 higher measures of scientific impact. We also found that articles by low/middle income  
207 countries authors were underrepresented among OA publications.

### 209 *Results in the Context of Published Literature*

211 OA refers to unrestricted and free online access to full-text published articles[12]. Some  
212 subscription-based journals provide OA publishing options to authors at the cost of article  
213 processing charges. Both *IJGC* and *Gynecologic Oncology* are among most often cited  
214 gynecologic oncology journals and each offers OA publishing at a cost to the authors. There  
215 is a great debate in recent years regarding publishing and knowledge distribution in  
216 academics [12-14]. Furthermore, the movement of endorsing OA publishing is increasing  
217 with some evidence that in 2015 nearly half the published literature was OA [5].

218 Open access publishing has a variety of advantages including social, economic, and  
219 academic benefits[15]. However, OA relies on financial support, either by the authors,  
220 institutions, or research funders. Article processing charges may be unaffordable for authors  
221 or institutions, particularly those in low/middle income countries. [16, 17]. Most literature

222 regarding OA publishing examines articles in journals that exclusively publish OA rather than  
223 in hybrid subscription journals, such as *IJGC* or *Gynecologic Oncology*. Therefore, the  
224 impact of OA publishing is difficult to estimate as there is limited comparison between OA  
225 and non-OA articles published within the same journal.[18, 19]. This introduces bias, as  
226 many open access journals are considered predator journals with an inherent poor quality  
227 [20-22]. Predator journals are publications that present themselves as legitimate scholarly  
228 journals. These journal may falsely claim to provide peer review, fail to reveal information  
229 about article processing charges, and may be prone to other violations of scholarly ethics.  
230 When analyzing data, readers should distinguish between OA journals with a rigorous peer  
231 review process and high academic standards and journals which have lower standards of  
232 peer review and are considered predatory journals, which publish lower impact articles with  
233 a lower citation and bibliometric potential.

234 Our finding that one in three recent articles in *IJGC* or *Gynecologic Oncology* were published  
235 under an OA license is in line with the literature in other specialties where an estimated 28%  
236 of articles are OA[5]. Outside gynecologic cancer research, the existence of an OA citation  
237 advantage (OA articles are more likely to be cited than non-OA articles) has been debated.  
238 Whether or not an OA citation advantage is identified in a given analysis seems to depend  
239 on the field of research in question, the methodology of the investigators, and the journal's  
240 impact factor. Our findings that CPY, relative citation ratio, and field citation ratio were higher  
241 in OA articles suggest that there an OA citation advantage is present in gynecologic cancer  
242 research. This hypothesis is further supported by the finding that OA status was  
243 independently associated with being among the most frequently cited articles in the two  
244 journals studied.

245 We found that 10% of all articles were written by authors in low/middle income countries.  
246 Among OA articles, an even smaller percentage were from low/middle income countries  
247 authors. Although an intuitive explanation would be that low/middle income countries authors  
248 find OA article processing charges to be prohibitive, the publishers for both journals in our  
249 study waive or reduce these fees for authors from low/middle income countries. For

250 example, *IJGC*'s publisher, BMJ Publishing Group, completely waives the full article  
251 processing charge for authors from low income countries[23].

252 Although we have found higher number of total citations in the non-OA group, we believe  
253 that this is a result of the 'seniority effect' (older studies accrue more citations over time).

254 Indeed, the adjusted measure – the number of citations per year is not higher in the non-OA  
255 group.

256 We demonstrate a strong correlation between OA proportion and journal impact factor.

257 There is scarce literature on this correlation, as most literature compares fully-OA journals to  
258 subscription based journals and some studies analyzed the conversion of journals from

259 subscription based to fully-OA model, also known as 'flipping'[24]. Generally, it is

260 understandable that OA articles are easier to access and therefore to cite, this would

261 increase the journal's impact factor. On the other hand, OA publications are more likely to

262 have research funding support and this could be a confounder for representing high quality

263 manuscripts funded by industry and randomized trials that would be published in higher

264 impact factor journals.

265

### 266 *Strengths and Weaknesses*

267

268 Among the strengths of the study is that it included all original research and review articles

269 published in two major gynecological cancer journals subsequent to when each journal

270 began offering OA publication. To our knowledge, this study is the first to evaluate whether

271 OA citation advantage exists in gynecologic oncology research. Our study has a number of

272 limitations. The number of variables in our regression analysis was limited, and unmeasured

273 confound could influence the relationship between OA status and high CPY. We defined the

274 country of origin was based on the geography of a single author. It is uncertain if more

275 comprehensive definition of article provenance would have resulted in different findings

276 Additionally, research relevant to our field can also often be found in other publications that

277 have broader focus (*Obstetrics & Gynecology, Journal of Clinical Oncology*). It is also

278 possible that OA policy has changed during the study period and that OA fees has changed,  
279 thereby we cannot exclude biases introduced by OA policy change during the study period.  
280 Finally, we did not analyze the different source of funding (industry, government etc.) which  
281 may be a counfounder.

282

### 283 *Implications for Practice and Future Research*

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285 While some publishers and journals might consider the OA model for various reasons, we  
286 hereby provide data regarding the role of OA in two subscription model journals in  
287 gynecologic oncology. The findings of our study should be further validated by future  
288 research of the impact of OA in other journals as well. This might aid in underlining  
289 inequalities between high and low/middle income countries in accessibility to the advantages  
290 of OA identified in our study.

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### 293 *Conclusion*

294 To conclude, in *IJGC* and *Gynecologic Oncology*, a third of recent articles are published OA.  
295 These OA-published articles have a higher number of citations per year and other citation  
296 metrics score compared to articles published without OA. Articles written by authors in  
297 low/middle income countries are underrepresented overall, but even more so among OA  
298 publications, raising a concern that authors from these regions face obstacles to using OA to  
299 publish and distribute their research work.

300 **Contributors** GL: conceptualization, data curation, methodology, investigation, formal  
301 analysis, writing—original draft, writing—review, and editing. RM: data curation,  
302 investigation, methodology, writing—review. RH: writing—review, and editing. JL - writing—  
303 review, and editing , RC - writing—review, and editing. PR: conceptualization, methodology,  
304 writing—review, and editing, supervision, conceptualization, project administration.

305 **Funding** None

306 **Competing interests** None declared.

307 **Patient consent for publication** Not applicable.

308 **Ethics approval** Not applicable.

309 **Acknowledgments** None

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311 **References**

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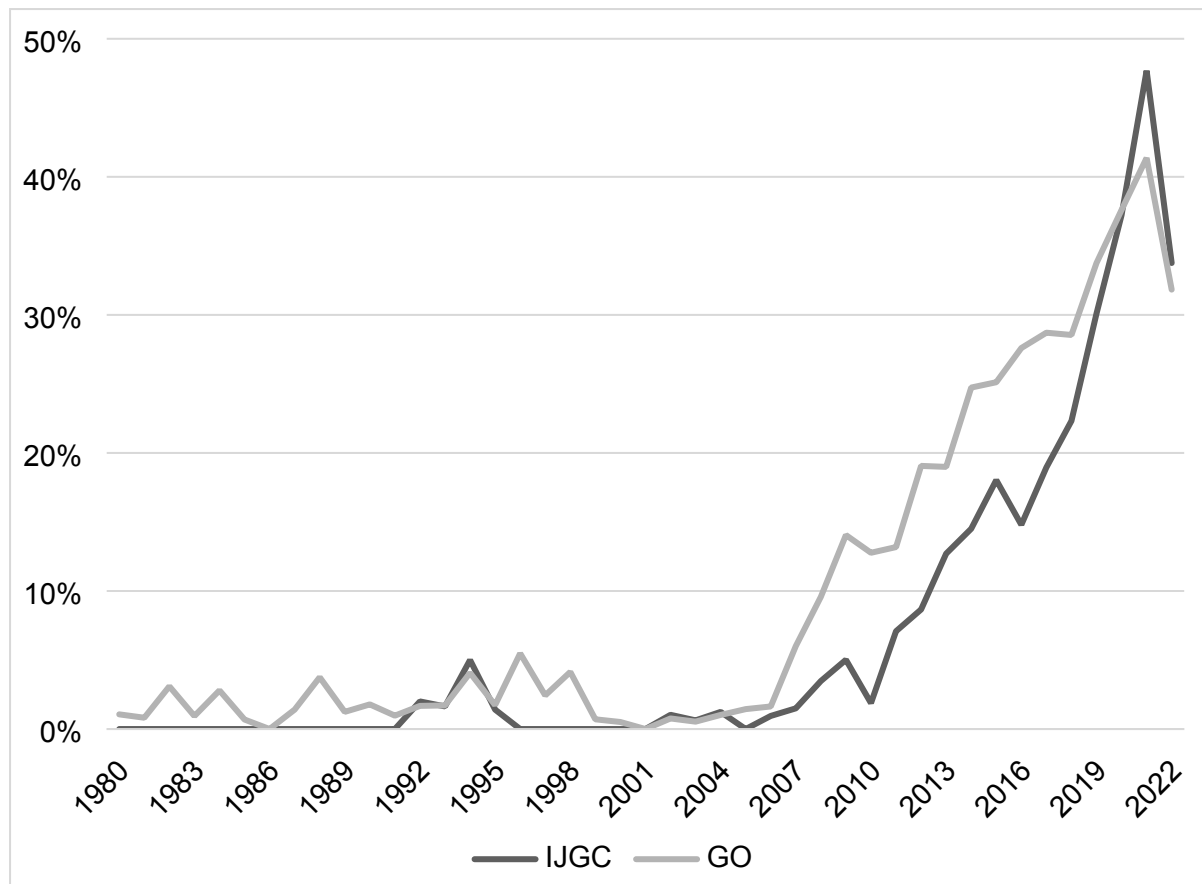
- 313 1. Pikowsky, R.A., *Electronic Journals as a Potential Solution to Escalating Serials*  
314 *Costs*. 1997: The Serials Librarian.
- 315 2. Schlimgen, J.B. and M.R. Kronenfeld, *Update on inflation of journal prices:*  
316 *Brandon/Hill list journals and the scientific, technical, and medical publishing market*.  
317 *J Med Libr Assoc*, 2004. **92**(3): p. 307-14.
- 318 3. Ahmed, S.S., et al., *Open access: the alternative to subscription-based medical*  
319 *publishing*. *West J Emerg Med*, 2008. **9**(4): p. 240-2.
- 320 4. Barić, H., et al., *Open access - is this the future of medical publishing?* *Croat Med J*,  
321 2013. **54**(4): p. 315-8.
- 322 5. Piwowar, H., et al., *The state of OA: a large-scale analysis of the prevalence and*  
323 *impact of Open Access articles*. *PeerJ*, 2018. **6**: p. e4375.
- 324 6. Anton, B., *Issues and impacts of the changing nature of scientific communication*.  
325 *Optom Vis Sci*, 2003. **80**(6): p. 403-10.
- 326 7. Adcock, J. and E. Fottrell, *The North-South information highway: case studies of*  
327 *publication access among health researchers in resource-poor countries*. *Glob*  
328 *Health Action*, 2008. **1**.
- 329 8. Veletsianos, G., & Kimmons, R, *Assumptions and challenges of open scholarship*.  
330 2012: *The International Review of Research in Open and Distributed Learning* , **13**  
331 (4), 166-189.
- 332 9. Singh, M., C.P. Prasad, and A. Shankar, *Publication Charges Associated with Quality*  
333 *Open Access (OA) Publishing and Its Impact on Low Middle Income Countries*

- 334 (*LMICs*), *Time to Reframe Research Policies*. *Asian Pac J Cancer Prev*, 2021. **22**(9):  
335 p. 2743-2747.
- 336 10. Iain D. Craig, A.M.P., Marie E. McVeigh, James Pringle, Mayur Amin, *Do open*  
337 *access articles have greater citation impact?: A critical review of the literature*. 2007:  
338 *Journal of Informetrics*. p. 239-248.
- 339 11. bank, W.
- 340 12. Wolpert, A.J., *For the sake of inquiry and knowledge--the inevitability of open access*.  
341 *N Engl J Med*, 2013. **368**(9): p. 785-7.
- 342 13. Loscalzo, J., *The Future of Medical Journal Publishing: The Journal Editor's*  
343 *Perspective: Looking Back, Looking Forward*. *Circulation*, 2016. **133**(16): p. 1621-4.
- 344 14. Watson, M., *When will 'open science' become simply 'science'?* *Genome Biol*, 2015.  
345 **16**: p. 101.
- 346 15. Tennant, J.P., et al., *The academic, economic and societal impacts of Open Access:*  
347 *an evidence-based review*. *F1000Res*, 2016. **5**: p. 632.
- 348 16. Matheka, D.M., et al., *Open access: academic publishing and its implications for*  
349 *knowledge equity in Kenya*. *Global Health*, 2014. **10**: p. 26.
- 350 17. Ellingson, M.K., et al., *Publishing at any cost: a cross-sectional study of the amount*  
351 *that medical researchers spend on open access publishing each year*. *BMJ Open*,  
352 2021. **11**(2): p. e047107.
- 353 18. Suarathana, E., et al., *Evaluation of Open-Access Journals in Obstetrics and*  
354 *Gynaecology*. *J Obstet Gynaecol Can*, 2021. **43**(12): p. 1434-1437.e1.
- 355 19. Özay, A.C., O. Emekci Ozay, and İ. Gün, *Comparison of subscription access and*  
356 *open access obstetrics and gynecology journals in the SCImago database*. *Ginekol*  
357 *Pol*, 2021.
- 358 20. Cortegiani, A., et al., *Predatory open-access publishing in critical care medicine*. *J*  
359 *Crit Care*, 2019. **50**: p. 247-249.
- 360 21. Ferris, L.E. and M.A. Winker, *Ethical issues in publishing in predatory journals*.  
361 *Biochem Med (Zagreb)*, 2017. **27**(2): p. 279-284.

- 362 22. Shamseer, L., et al., *Potential predatory and legitimate biomedical journals: can you*  
363 *tell the difference? A cross-sectional comparison*. BMC Med, 2017. **15**(1): p. 28.
- 364 23. Hub, B.A., *Waivers and discounts*.
- 365 24. Momeni, F., Mayr, P., Fraser, N. *et al.*, *What happens when a journal converts to*  
366 *open access? A bibliometric analysis*. . *Scientometrics*.
- 367
- 368
- 369
- 370
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390 **Fig 1 – Proportion of Open Access publications in *IJGC* and *Gynecologic Oncology***

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393 Footnote:

394 IJGC: *International Journal of Gynecological Cancer*, GO: *Gynecologic Oncology*. IJGC  
 395 began offering Open Access publishing in 1992. For year 2022, data available only for  
 396 January to October.

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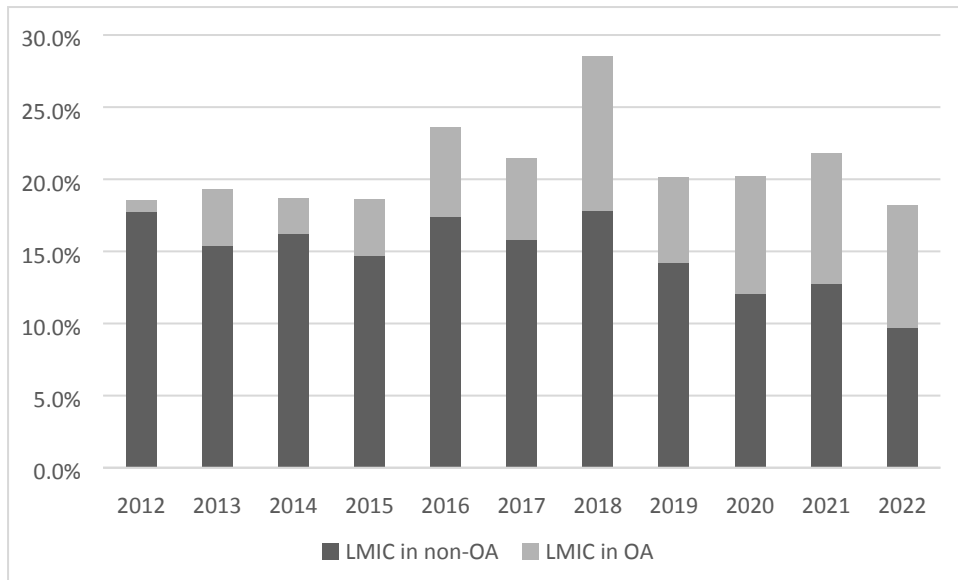
403

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405 **Fig 2** Proportion of Open Access and non-Open Access publications per year by authors  
406 from low/middle income countries since 2012

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409 LMIC – low/middle income countries, OA – open access

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424 **Table 1.** Open Access publications compared to non-Open Access publications (n=18,515)

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<b>Characteristics</b>	<b>Open Access (n=2,398)</b>	<b>Non-Open Access (n=16,117)</b>	<b>P value</b>
Citations per year	3 (1.5-5.3)	1.3 (0.6-2.7)	<0.001
Field citation ratio	6.1 (4.8-7.4)	4.4 (3.2-5.8)	<0.001
Relative citation ratio	0.9 (0.5-1.8)	0.7 (0.3-1.3)	<0.001
Total citations	14 (6-31)	18 (8-35)	<0.001
Usage count since 2013	4 (2-8)	2 (0-4)	<0.001
Year of publication	2015 (2012-2018)	2006 (1998-2012)	<0.001
Number of pages	7 (6-8)	6 (5-7)	<0.001
Funded, n (%)	1,868 (77.9%)	3,243 (20.1%)	<0.001
Geographic region, n (%)			
Africa	9 (0.4%)	101 (0.6%)	
Central/South America	31 (1.3%)	265 (1.6%)	
Asia	163 (6.8%)	3,572 (22.2%)	<0.001
Europe	489 (20.4%)	4,430 (27.5%)	
North America	1,654 (69.0%)	7,338 (45.5%)	
Oceania	52 (2.2%)	411 (2.6%)	
Low/medium income country authorship, n (%)	132 (5.5%)	1,726 (10.7%)	<0.001

Figures are median (IQR) unless indicated otherwise.

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428 **Table 2.** Publications with high CPY ( $\geq 90^{\text{th}}$  percentile) compared to publications with CPY  
 429  $< 90^{\text{th}}$  percentile (n=17,947)

Characteristics	CPY $\geq 90^{\text{th}}$	CPY $< 90^{\text{th}}$ percentile	P value
	percentile n=1,801	n=16,146	
Citations per year, median (IQR)	7.7 (6.4-10.7)	1.3 (0.6-2.4)	<0.001
Total citations, median (IQR)	61 (30-106)	16 (8-31)	<0.001
Usage count since 2013, median (IQR)	7 (3-13)	2 (0-4)	<0.001
Year of publication, median (IQR)	2015 (2009-2019)	2006 (1999-2013)	<0.001
Funded study	947 (52.6%)	4,005 (24.8%)	<0.001
Geographic Region			
Africa	3 (0.2%)	98 (0.6%)	
Central/South America	18 (1.0%)	256 (1.6%)	
Asia	243 (13.5%)	3,402 (21.1%)	<0.001
Europe	492 (27.3%)	4,263 (26.4%)	
North America	1,007 (55.9%)	7,724 (47.8%)	
Oceania	38 (2.1%)	403 (2.5%)	
Open access	541 (30.0%)	1,712 (10.6%)	<0.001
Low/medium income country authorship	144 (8.0%)	1,643 (10.2%)	0.003

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430 Figures are n (%) unless indicated otherwise. 17,947 (96.9%) of the articles had a  
431 citations per year score.

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458 **Table 3.** Multivariable analysis of characteristics associated with high CPY ( $\geq 90^{\text{th}}$  percentile)

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Variable	Adjusted Odds Ratio	95% Confidence Interval
Published after 2007	4.93	4.26-5.71
Open Access	1.47	1.29-1.68
Research Funding Reported	1.61	1.43-1.82
Geographic region		
Ref. (other*)	-	-
Africa	0.33	0.10-1.12
Central/South America	0.48	0.27-0.84
Asia	0.57	0.46-0.70
North America	1.06	0.94-1.19
Low/medium income country		
authorship	1.12	0.86-1.46

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461 \*Other – Europe and Oceania. 17,947 (96.9%) of the cohort had a citations per year score. A

462 total of 1,801 articles had CPY  $\geq 90^{\text{th}}$  percentile.

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