



Predatory Open-Access Publishing in Anesthesiology

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Predatory publishing is an exploitative fraudulent open-access publishing model that applies charges under the pretense of legitimate publishing operations without actually providing the editorial services associated with legitimate journals. The aim of this study was to analyze this phenomenon in the field of anesthesiology and related specialties (intensive care, critical and respiratory medicine, pain medicine, and emergency care). Two authors independently surveyed a freely accessible, constantly updated version of the original Beall lists of potential, possible, or probable predatory publishers and standalone journals. We identified 212 journals from 83 publishers, and the total number of published articles was 12,871. The reported location of most publishers was in the United States. In 43% of cases (37/84), the reported location was judged as “unreliable” after being checked using the 3-dimensional view in Google Maps. Six journals were indexed in PubMed. Although 6 journals were declared to be indexed in the Directory of Open Access Journals, none were actually registered. The median article processing charge was 634.5 US dollars (interquartile range, 275–1005 US dollars). Several journals reported false indexing/registration in the Committee on Publication Ethics and International Committee of Medical Journal Editors registries and Google Scholar. Only 32% (67/212) reported the name of the editor-in-chief. Rules for ethics/scientific misconduct were reported in only 24% of cases (50/212). In conclusion, potential or probable predatory open-access publishers and journals are widely present in the broad field of anesthesiology and related specialties. Researchers should carefully check journals’ reported information, including location, editorial board, indexing, and rules for ethics when submitting their manuscripts to open-access journals. (*Anesth Analg* 2019;128:182–7)

Predatory publishing has been defined as an exploitative fraudulent open-access publishing model that applies charges to authors under the pretense of legitimate publishing operations without actually providing the editorial services associated with legitimate journals.^{1–3} During the last decade, this phenomenon has increased considerably, and it has been highlighted as one of the most difficult issues for the scientific community. Recent studies have reported that more than half a million articles have been published in predatory journals. Surprisingly, this number almost matches the number of articles published in legitimate open-access journals.^{2,4} Predatory journals frequently use spam email to solicit scholars to submit articles, offering fast peer-review and an invitation to join the editorial board (EB).^{4,5} Researchers or scholars required to improve their curricula may easily become victims of this fraudulent business model.⁶ Predatory journals may also be

the target for fabricated data or scientific frauds because of the low level of editorial control and questionable or absent peer-review process.⁶ Moreover, predatory publishing has been associated with a wide range of scientific misconduct, such as exploiting scientific articles and identities for gaining fake editorial positions, mimicking the names or websites of established journals, and citing fake metrics.^{6,7}

In 2012, Jeffrey Beall, a librarian of the University of Colorado Denver, launched a blog including a list of potential, possible, or probable predatory open-access publishers and journals.⁶ Although it was discontinued in January 2017, anonymous researchers regularly update the list using the original criteria.^{8–11} To differentiate between legitimate and nonlegitimate publishers and journals, respectable international organizations, including the Committee on Publication Ethics (COPE) and Directory of Open Access Journals (DOAJ),¹² have described principles of transparency and best practice in scholarly publishing. These principles include detailed information about the publishers, EB, indexing, and editorial process.¹³

The ability to judge the reputability and ethics of a journal is not always applied at the early stage of scientific careers.^{6,14} Recently, awareness campaigns have been launched to help researchers to recognize and avoid predatory journals and to choose the right journal for their articles. The “Think. Check. Submit.” campaign, endorsed by several publishers and organizations, encourages researchers to retrieve information about the journals to which they are planning to submit their articles, including contact details, location, and indexing.^{15,16}

Predatory publishing has been specifically surveyed in specialties such as neuroscience/neurology, rehabilitation, dermatology, and nursing.^{17–21} However, the field of anesthesiology, including intensive care, critical and respiratory medicine, pain medicine, and emergency care, has not been specifically investigated. The aim of this study was

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Accepted for publication August 10, 2018.

Funding: None.

Conflicts of Interest: See Disclosures at the end of the article.

Clinical trial number and registry URL: Not applicable.

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DOI: 10.1213/ANE.0000000000003803

to describe the characteristics and activities of potentially predatory open-access publishers and journals linked to anesthesiology and its related specialties.

METHODS

Our search was based on an archived but regularly updated version of the original Beall list. This version is freely accessible online.⁸ The list aims to summarize potential, possible, or probable predatory scholarly open-access publishers using predefined criteria. We also searched a second list of standalone journals (not released by a specific publisher) compiled by the same source. The criteria were 2 documents published by COPE: (1) code of conduct for journal publishers, and (2) principles of transparency and best practice in scholarly publishing. The start date of the search was October 15, 2017. A full description of the criteria can be found on the list website.⁸

Two authors (A.C., F.L.) independently searched the lists and retrieved the information. A third author (F.S.) solved discrepancies by consensus. We assessed the listed items and searched journals including at least one of the following terms pertinent to the field: anesthesia or anesthesiology or anesthesia or anesthesiology or intensive or critical or resuscitation or trauma or emergency or pain or analgesia or respiratory or sepsis or shock. If a journal was thought to be pertinent, even without matching these terms, its inclusion was evaluated by consensus. We checked journal websites to obtain the following information: (1) location of the publisher. We reported the country and verified the specified address, if any, by using Google Maps and 3-dimensional Street View using the methodology of Shen and Bjork.² After being checked, the location was described as “reliable,” “unreliable,” or “impossible to determine”; (2) the article processing charges (APCs) and the possibility of price reduction for low-income countries. We reported the APC for a standard original research article from a high-income country. The currency used was US dollar (USD). Prices given in different currencies were converted using the current exchange rate on December 10, 2017; (3) the databases in which the journal was claimed to be indexed. We checked if the journal was actually indexed in PubMed, Scopus, and Google Scholar. For journals claiming registration in the DOAJ and/or in the list of journals following the International Committee of Medical Journal Editors (ICMJE) or COPE guidelines, we checked the relevant list for confirmation; (4) the number of articles published by each journal at the time of accessing the journal website and the number of years of journal activity; (5) review process duration, defined as the time between submission and acceptance, of the last 5 articles published in the current issue of the journal; (6) the number of EB members and the presence of an editor-in-chief (EIC), including his/her number of publications in Scopus. We also evaluated the appropriateness of the entire EB on the basis of the reported affiliation. We categorized the EB as “inappropriate” when 30% or more of the members had an affiliation incongruent with the journal field; (7) the presence of a description of the editorial process and the rules for defining scientific misconduct and subsequent article retraction; (8) the method of manuscript submission (eg, email, submission manager

system); and (9) the quality of English language on the journal website, graded by a native speaker as “very low,” “low,” or “standard.”

Statistical Analysis

Data management and calculation were performed using Microsoft Excel (version 2013; Microsoft Corporation, Redmond, WA). We calculated and reported the mean and standard deviation for variables with a normal distribution or median and interquartile ranges (IQRs, 25th–75th) when distribution was not normal. We also reported range values.

RESULTS

Among 1185 publishers and 1391 standalone journals from the 2 lists, we identified 83 publishers for a total of 212 pertinent journals. On the basis of the journal titles, the primary field of interest was anesthesiology in 28% of cases (59/212), intensive/critical care/respiratory medicine in 28% of cases (60/212), pain in 7% of cases (15/212), emergency/trauma care in 23% of cases (49/212), and mixed in 14% of cases (29/212).

Publishers' Location, Contact Details, and Language Quality

Figure 1 shows the declared worldwide distribution of publishers. Most of the publishers' websites reported a primary address in the United States (50/83, 60%), followed by India (11/83, 13%) and the United Kingdom (7/83, 8%). Ten percent (8/83) claimed to be located in other countries (Canada, China, Hong Kong, Singapore, United Arab Emirates, and the Netherlands). In 9% of cases (7/83), the publisher's country was unspecified. Multiple addresses in >1 country were reported in 8% of cases (10/83). The publisher's reported location was judged as “unreliable” in 43% of cases (37/83). Figure 2 shows examples of “unreliable” locations. For 2% of the publishers (5/83), the reported address did not consent localization.

Ninety-four percent (199/212) of the journal websites reported a professional email address related to an editorial or publisher office.

The quality of English language was graded as “standard” in 30% of cases (70/212), “low quality” in 52% of cases (111/212), and “very low quality” in 15% of cases (31/212).

Databases, Metrics, International Standard Serial Numbers

Concerning indexing, 53% of cases (113/212) did not report any database coverage. For journals claiming ≥ 1 database, the median number of databases was 5 (IQR, 1–12; range, 1–45). The Table shows the number (and percentage) of journals claiming to be indexed in the following major databases or registries: PubMed, Scopus, Google Scholar, ICMJE, COPE, and DOAJ. The Table also shows the number of journals with verified indexing or registration. Fifty-three journals (25%) claimed to use or to be affiliated with ≥ 1 of the known “misleading or fake metrics” such as “Global Impact Factor, Index Copernicus, and CiteFactor.” Of the 95 journals reporting an International Standard Serial Number (ISSN), 77 ISSNs were verified as actually being associated with the relevant journal.

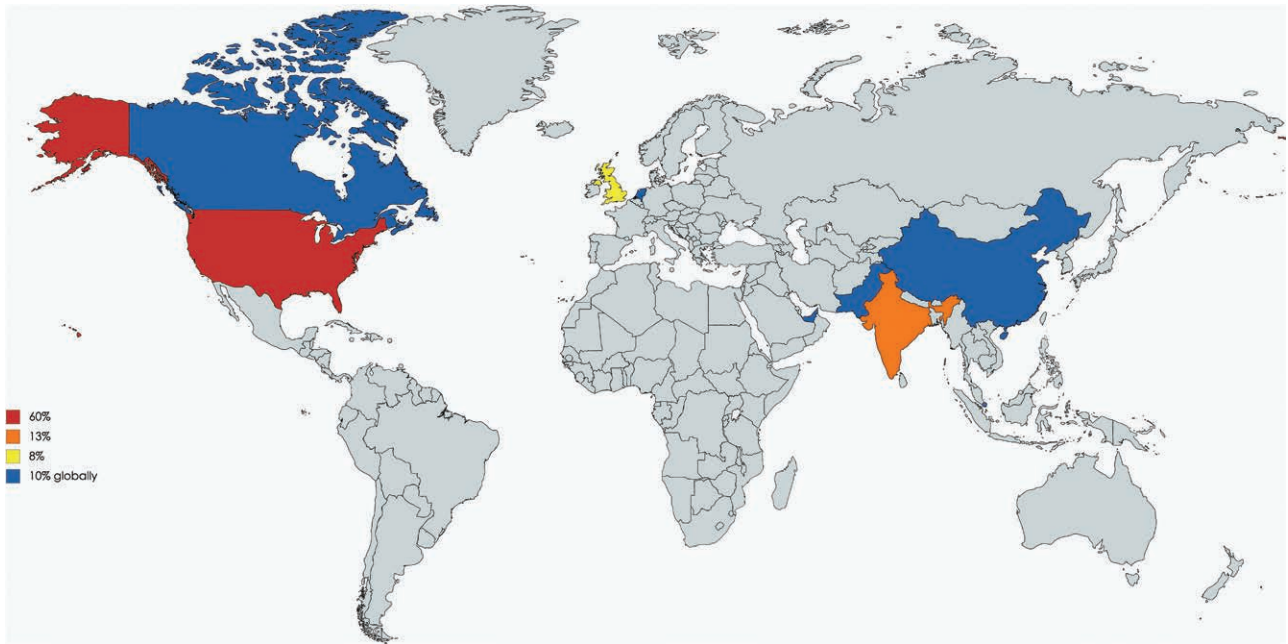


Figure 1. Distribution of reported publishers by country. A map chart showing distribution of reported publishers by country indicated as percentage. Different colors indicate different frequencies of distribution. Nine percent of the publishers did not specify the country.

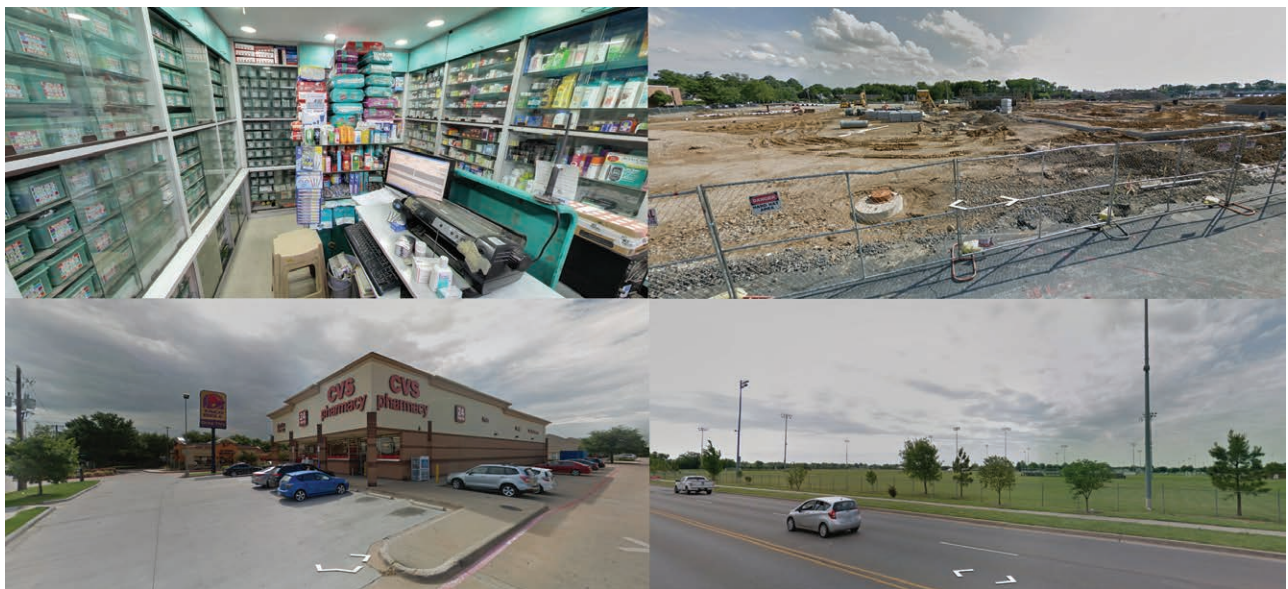


Figure 2. Examples of unreliable reported locations. The figure depicts examples of unreliable locations declared by 4 publishers (2 pharmacies on the left; a work area and a football pitch on the right), as assessed through Google Maps and 3D street view. 3D indicates 3-dimensional.

APCs and Submission Process

A total of 166 journals (73%) clearly reported the amount of APCs for publication. The median APC amount was 634.5 USD (IQR, 275–1005 USD; range, 0–3649 USD). A total of 67 journals (32%) claimed to apply APC reduction for articles from low- or middle-income countries.

The most common method of manuscript submission was via a webpage (71/212, 33%), followed by email/submission manager (47/212, 22%), email only (43/212, 20%), and a submission manager only (20/212, 9%). In 3 cases, this information was absent.

Editorial Board

Thirty-two percent (67/212) of the journals reported to have an EIC, along with the name and affiliation. The median number of articles authored by EICs and published in Scopus was 69 (IQR, 16–172; range, 0–811).

Seventy-nine percent of the journals reported their EB, with a median of 24 members (IQR, 12–38; range, 2–523). For 16/212 journals (8%), the competency of the EB, on the basis of the reported affiliation, was judged as incongruent with the scope of the journal. In 36% of cases (77/212), it was indeterminable.

Table. Declared and Verified Indexing/Registration of Retrieved Journals

Database	Journals Claiming to be Indexed or Registered, N (%) ^a (Total: 212)	Verified Indexing or Registration, N (%) ^b
PubMed	6 (3)	6 (100)
Scopus	6 (3)	6 (100)
Google scholar	83 (39)	56 (67)
ICMJE	68 (32)	16 (24)
COPE	68 (38)	2 (3)
DOAJ	6 (3)	0 (0)

Abbreviations: COPE, Committee on Publication Ethics; DOAJ, Directory of Open Access Journals; ICMJE, International Committee of Medical Journal Editors.

^aPercent of total journals.

^bRow percent.

Fifty-eight journals out of 212 (27%) reported a call for reviewers on their website. A call to join the EB was found on 30% (64/212) of the journals' websites.

Published Articles, Review Process, and Editorial Flow

Thirty-one percent of the journals had no published articles (65/212). For journals that had published ≥ 1 article, the median number of published articles was 25 (IQR, 7–60; range, 1–3444). The total number of published articles was 12,871. The median time of publication activity was 2 years (IQR, 1–5; range, 1–21).

The median duration of the review process was 32 days (IQR, 18–64 days; range, 1–333). In 44% of cases, we were unable to determine the duration of the review process because the dates of submission and/or acceptance were not reported.

Fifty-one percent (109/212) of the journals clearly reported a description of their editorial process, including peer review. Only 50 journals (24%) reported the criteria for scientific misconduct and article retraction.

DISCUSSION

The main finding of the present study is that potential or probable predatory publishing is actively occurring in the broad field of anesthesiology, as shown by the high number of retrieved journals (212), publishers (83), and published articles (12,871). Notably, the number of journals is more than double the number of journals registered in the DOAJ and pertinent to the field (106).¹² Two recent studies attempted to describe this phenomenon in the fields of neuroscience/neurology and rehabilitation, using the original Beall list.^{17,18} Interestingly, the authors found a lower number of journals and published articles: 188 journals and a total of 5538 articles in the field of neuroscience/neurology, and 59 journals and 5610 articles in the field of rehabilitation.^{17,18}

To the best of our knowledge, this is the first study addressing predatory journals in this field. We used search terms that also encompass critical and respiratory medicine, emergency care, and pain medicine because some of the journals related to these subspecialties are ranked among anesthesiology and critical care medicine journals in major databases (eg, Journal Citation Reports, SCImago Journal Rank). Moreover, our intention was to analyze the complete range of predatory journals that an anesthesiologist/

critical care physician may consider for submission of his/her research in the field. The short time of activity and the high proportion of journals that have not published articles may indicate that this phenomenon is rapidly expanding in this field.

The United States was the most common of the publishers' reported locations. However, predatory publishers may falsely declare an address in the United States or United Kingdom to improve their credibility and attract researchers from high-income countries.²⁷ Interestingly, the reported location, checked using Google Maps and Google Street View, was considered "unreliable" in almost 50% of cases. Figure 2 presents examples of unreliable publishers' locations. The most common retrieved locations in these cases were residential houses in rural or peripheral areas, but also included markets, pharmacies, post offices, and restaurants. On the basis of these findings, researchers should check the reported address of a journal's publisher before submitting a manuscript. Notably, a professional email address should not be considered characteristic of legitimate journals.

Few journals were indexed in PubMed or Scopus. Although indexing in major databases has been described as a tip for identifying genuine, nonpredatory open-access journals,²² other studies have retrieved indexed journals that were potentially predatory.^{17,18} False database indexing and misleading metrics are known characteristics of predatory journals. We demonstrated a discrepancy between reported and real indexing/registration in Google Scholar, DOAJ, ICMJE, and COPE. The DOAJ is an independent directory that indexes high-quality, peer-reviewed journals through a public database.¹² Notably, no journal was registered in the DOAJ, which seems to be the most reliable registry for this purpose. It should also be underlined that 25% of journals claimed fake metrics, the most common of which were "Global Impact Factor," "Index Copernicus," and "CiteFactor."^{22–24} Almost 30% of journals did not clearly report their APCs. The practice of revealing APCs only after articles have been accepted is common among predatory journals and is clearly prohibited by international recommendations.¹³ The median APC for a research article was similar or slightly higher than in other fields (ie, 499 USD in the rehabilitation field and 521–637 USD in the neuroscience/neurology field),^{17,18} but it was considerably lower than those of genuine open-access journals.^{24,25}

Only one-third of journals reported the name of an EIC, which is one of the requirements of international recommendations.¹³ Nonetheless, most of the EICs had considerable editorial experience on the basis of Scopus output, and in a few cases, the EICs were highly noteworthy in their field. Several EB members were involved with >1 journal and ranged from experts in the field to young men wearing superhero t-shirts. The competence of the EBs was not assessable in many cases. One potential explanation for the involvement of experts may be that many predatory journals are not easy to recognize. Several journals have professional-looking websites resembling those of genuine journals, use standard English, and have published hundreds of articles. Nonetheless, their actual editorial processes lack transparency and do not follow international rules.^{7,22} Some tips and scoring systems have been proposed for determining the grades of journals and the probability of misconduct.^{15,21}

Before joining questionable editorial projects as reviewers or EB members, researchers should carefully evaluate the characteristics of publishers and journals.⁶ The information provided about the EIC and EB should be carefully checked when considering a journal's transparency.

Finally, editorial processes and the rules against scientific misconduct should always be described on a journal's website. In our study, <1 in 4 journals reported rules against scientific misconduct. This information can be considered useful in evaluating a journal's ethics.

Study Limitations

The main limitation of this study is related to the lists used for the search. The lists were based on the discontinued Beall list, which was active from 2010 to January 2017, and anonymous researchers regularly update them. Jeffrey Beall decided to close his blog presumably after lawsuits from publishers included in the list and because of pressure from his employer.^{10,26,27} The list was criticized because it was completed by a single person responsible for including or excluding journals on a "black list"²⁸ and because a few newly launched legitimate journals had been erroneously included, although temporarily. However, several reports have underlined that the Beall list is an accurate, widely used, and sensitive source of information. Moreover, it is still considered one of the most reliable sources of information about this topic.^{9,10,29,30} The text accompanying the list underlines that it collects "potential, possible, or probable predatory scholarly open-access publishers" and that "publishers and journals change in their business and editorial practices over time."⁸ Moreover, the list does not further classify in potential, possible, or probable predatory open-access publishers and journals. Other "blacklists" are available, but they are not freely accessible and no studies have evaluated their quality.²² It should also be noted that most of the studies evaluating predatory publishing in other medical fields have used the Beall list for searches.¹⁷⁻¹⁹ Another potential limitation is that the reported locations were checked using Google Maps and 3-dimensional Street View; although this method may be prone to subjectivity, it has been used in other studies and has also been suggested by the "Think. Check. Submit." campaign.^{2,15,17,18}

We did not analyze either the quality or metrics of published articles and we did not contact the EB members. This would have allowed us to verify their positions and to collect data about their activity. Finally, we did not contact the authors of the retrieved articles and we could not collect feedback about their editorial experience or motivations for journal selection. However, it may be difficult to reliably assess these aspects because of the extremely high number of potential EB members and authors.

CONCLUSIONS

Potential or probable predatory open-access publishers and journals are widely present in the broad field of anesthesiology. Researchers should form their decision to submit articles not only on the basis of reviewing "black lists" but also by judiciously considering a journal's characteristics, registration in the DOAJ, COPE, and ICMJE registries, and indexing in reliable databases.¹⁵ To avoid potential

predatory journals, researchers should always check the publisher's reported location, the presence of an EIC, and the EB. English language form and rules for scientific misconduct should also be taken into account.

Further research on this topic should focus on authors' and EB members' feedback and motivation and on the quality of published articles. ■■

DISCLOSURES

Name: Andrea Cortegiani, MD.

Contribution: This author helped conceive the study, create and perform the search, perform the statistical analysis, write the manuscript, and approve the final version.

Conflicts of Interest: A. Cortegiani is an associate editor for the open-access journals *BMC Anesthesiology* and *Clinical Case Reports*.

Name: Federico Longhini, MD.

Contribution: This author helped conceive the study, perform the search, write the manuscript, and approve the final version.

Conflicts of Interest: None.

Name: Filippo Sanfilippo, MD, PhD.

Contribution: This author helped conceive the study, resolve discrepancies in the search output by consensus, write the manuscript, and approve the final version.

Conflicts of Interest: None.

Name: Santi Maurizio Raineri, MD.

Contribution: This author helped conceive the study, write the manuscript, and approve the final version.

Conflicts of Interest: None.

Name: Cesare Gregoretti, MD.

Contribution: This author helped conceive the study, write the manuscript, and approve the final version.

Conflicts of Interest: None.

Name: Antonino Giarratano, MD.

Contribution: This author helped conceive the study, write the manuscript, and approve the final version.

Conflicts of Interest: None.

This manuscript was handled by: Thomas R. Vetter, MD, MPH.

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