

# A review of forensic science peer-reviewed primary literature: a guide for students and professionals

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**Abstract:** The paper reviews fifty-three forensic science peer-reviewed journals based on several factors including cost to publish, cost to access, impact factor, indexing, frequency of publication, acceptance rate, affiliation, publisher, content, geography, and years of circulation. Journals considered to be predatory were not considered. The findings of this review indicate that costs can be problematic for those seeking access, in addition to a lack of information that may make it uncertain which journals are best to access depending on need. Furthermore, many forensic specialties are underrepresented across forensic science journals. Many of the journals identified for this review originated in North America and Europe, showing a geographical skew in widely available forensic information. Forensic professionals, students, and others associated with the field must consider the interrelationship between these various factors and their relative significance to better understand the lack of access to published research.

**Keywords:** forensic science primary literature, access, forensic science education

## Introduction

The accessibility of forensic science primary literature is an ongoing concern in the discipline, as the published research is often not easily accessible to those who might benefit most from it. Groups of interest include but are not limited to forensic professionals both within and independent from laboratories, students, and educational institutions. Various factors can influence the general availability of a journal, with barriers both financial and otherwise. The intersection of these barriers is reviewed and described in the context of costs to publish and access, impact factor, indexing, frequency of publication, acceptance rate, affiliation, publisher, content, geography, and age across fifty-three selected journals (TABLE 1). Some journals are not forensic science specific journals per se but rather have a history of publications with a forensic science application (i.e. Croatian Medical Journal, PLOS ONE, The Microscope). Emails were sent to publishers and editors in an attempt to ascertain information with varying degrees of response and disclosure.

**TABLE 1** List of surveyed journals with publisher.

Academic Forensic Pathology (SAGE)
American Journal of Forensic Pathology and Medicine (Wolterskluwer)
Arab Journal of Forensic Sciences and Forensic Medicine (Naif Arab University)
Association for Crime Scene Reconstruction Journal: The Scene (Association for Crime Scene Reconstruction)
Australian Journal of Forensic Sciences (Taylor and Francis)
Brazilian Journal of Forensic Sciences, Medical Law, and Bioethics (Instituto Paulista de Estudos Bioéticos e Jurídicos)
Canadian Society of Forensic Science Journal (Taylor and Francis)
Croatian Medical Journal (DNA only) (Medicinska Naklada)
Drug Testing and Analysis (Wiley)
Egyptian Journal of Forensic Sciences (Springer Open)
Environmental Forensics (Taylor and Francis)
Forensic Chemistry (Elsevier)
Forensic Genomics (Mary Ann Liebert)
Forensic Imaging (Elsevier)
Forensic Science International (Elsevier)
Forensic Science International: Animals and Environments (Elsevier)
Forensic Science International: Digital

Investigation (Elsevier)  
Forensic Science International: Genetics (Elsevier)  
Forensic Science International: Genetics Supplement Series (Elsevier)  
Forensic Science International: Mind and Law (Elsevier)  
Forensic Science International: Reports (Elsevier)  
Forensic Science International: Synergy (Elsevier)  
Forensic Science Journal (Department of Forensic Science Central Police University, Taiwan)  
Forensic Sciences Research (Taylor and Francis)  
Forensic Science Review (Central Police University Press)  
Forensic Science, Medicine and Pathology (Springer)  
Forensic Sciences (MDPI)  
Forensic Toxicology (Springer)  
International Journal of Legal Medicine (Springer)  
Journal of American Society of Questioned Document Examiners (American Society of Questioned Document Examiners)  
Journal of American Society of Trace Evidence Examiners (American Society of Trace Evidence Examiners)  
Journal of Analytical Toxicology (Oxford)  
Journal of Bloodstain Pattern Analysis (International Association of Bloodstain Pattern Analysts)  
Journal of Firearms and Tool Mark Examiners (Association of Firearms and Toolmark Examiners)  
Journal of Forensic and Legal Medicine (Elsevier)  
Journal of Forensic Document Examination (Association of Forensic Document Examiners)  
Journal of Forensic Identification (International Association for Identification)  
Journal of Forensic Nursing (Wolterskluwer)  
Journal of Forensic Science Education (Texas Digital Library)  
Journal of Forensic Sciences (Wiley)  
Journal of the National Academy of Forensic Engineers (National Academy of Forensic Engineers)  
Legal Medicine (Elsevier)  
Malaysian Journal of Forensic Science (Universiti Sains Malaysia, Kubang Kerian)  
Medicine, Science and the Law (SAGE)  
Microgram Journal (Drug Enforcement

Agency) (defunct)  
PLOS ONE (DNA only) (Library of Science)  
Problems of Forensic Science (Publishing House of the Institute of Forensic Expertise)  
Romanian Journal of Legal Medicine (Ulrichsweb.com)  
Scandinavian Journal of Forensic Science (Walter de Gruyter)  
Science and Justice (Elsevier)  
Spanish Journal of Legal Medicine (Elsevier)  
The Microscope (McCrone Research Institute)  
WIREs Forensic Science (Wiley)

Cost is a primary concern for many interested parties when it comes to considering journal access and submission. When publishing an article, the cost to the submitting author is not necessarily clear or easy to locate. However, the cost is typically a direct result of author's choice for their article to be open access, or if the journal itself is a completely open access journal. The responsibility for paying for open access or other publication fees lies with the author and/or their research funder. If authors do not wish to pay these publication fees or have the resources to do so, they can also go the route of having the subscribers pay for access to the articles. This leads to considering how much the subscriber would have to pay in order to access these published works. The cost to access published articles can be a frustrating process for potential readers when articles have not been made Open Access by their authors and may prove unaffordable for interested parties with fewer monetary resources.

Journals that do not offer open access or are hybrid often require a fee for access to a journal article. Access is typically cost per article and is often time limited.

Frequently discussed in the realm of academic publishing is a journal's impact factor. The concept of an impact factor (IF) was first developed in the 1950s by Dr. Eugene Garfield and Irving H Sher (1). The metric they created, also known as journal impact factor (JIF), involves determining the number of citations articles published within the last two years received, and dividing it by the total number of articles published in the journal during those two years. By creating such a metric, Dr. Garfield wanted to assist the scientific community in better comparing journals, as simply relying on how many articles a journal publishes per year might cause smaller journals to be overlooked or perceived as less important.

Impact factors are published by Clarivate in their Journal Citation Reports (JCR). Unfortunately, this is a paid service, so official impact factors are inaccessible for anyone who has not paid the fee. Since accessibility is a central concept of this paper, it will be more appropriate to use an open access alternative to the impact factor. Some journals disclose an impact factor on their website. Alternatively, impact factors are freely reported by Resurchify and are generated based on the yearly average number of citations to recent articles published in that journal. Resurchify uses Scopus as its source database (2).

A crucial issue in considering journal accessibility is indexing, defined as a group of items pulled together with a purpose. In the context of journals, this refers to a system of organization by subject, discipline, or type of publication in a database for reader access. For a journal to be indexed, it must generally be vetted to be included in that particular database (3). Thus, it is the general consideration that journals which are indexed frequently in reputable places are also reputable themselves. That is to say that indexed journals are considered of higher quality than journals that are not indexed, regardless of any other factors which may qualify the journal as one of value (4). Selecting where a journal is indexed will influence the overall accessibility of a journal, meaning that wherever it is databased will affect who may have access to that journal or the articles within.

Another factor which may be considered when submitting to a scientific journal is the acceptance rate. This value corresponds to the number of publications by a journal versus their total volume of submissions. This figure provides insight as to journal's selectivity and may influence interested authors who are seeking to publish. The acceptance rate for a journal may be reported on a journal's website, but in some cases the editor-in-chief must be directly contacted to request the most accurate value. Journals may not always be willing to disclose this information or may not be able to. Comparison of acceptance rates among forensic journals is essentially idle and additional elements must be taken into account such as the scope and size of the journal as well as the time frame from which the rate was concluded. The acceptance rate for a journal with a high volume of submissions and broad scope cannot be directly compared to one reported by a discipline specific, low volume journal. Therefore, evaluation of these rates must be cautiously approached with these considerations in mind.

The publication frequency refers to the schedule upon which a journal publishes, whether that be annually, monthly, or otherwise. This can vary from journal to journal, based on their own procedures. The amount of publications output in a year and the rate at which they are distributed can affect the total visibility of the journal. This may result in a lack of accessibility if the volume of their publications is not such that they achieve high

metrics in citation and thus impact factor. Furthermore, those journals which publish more often may only cover specific topics not applicable to all parties of interest within the field.

The publisher of a journal may also affect the relative accessibility of research to the forensic audience at large. The notoriety or size of the publisher may become particularly salient when the journal is known for its prevalence with scientific publishing, thus affecting the perceived value of all journals associated with it. Accessibility must also be considered in light of the affiliation of the journal, given that the journal has organizational ties. Just as prestige exists with well-established publishers, so does it exist with notable organizations in the field such as national and international academies of forensic scientists. Membership to these organizations may provide access to content that is otherwise unattainable to the forensic community at large.

In any science, existing knowledge and techniques must be presented to peers within the field, identifying gaps which need to be addressed. One way for the forensic science community to access these developments is to access different forensic science related journals with various content coverage (5). Within the broader field of forensics, however, lies many subdisciplines with specific needs, and the content that is suitable and relevant to a forensic drug chemist may be of little practical value to an entomologist. Broad accessibility of contemporary forensic research within these journals is advantageous for the evolution of the field. It is also important for each discipline within the field to have that same amount of access, and therefore would require a proportionate number of publications per discipline.

Ideally, the content throughout forensic science journals should be of high quality and equally representative of the reported scope of the journal. The quality of content is essential as there is a potential to use such information as supporting evidence in court (5). The article content, however, is driven by the need for research and interest in certain disciplines. In this study, the content per discipline is evaluated and compared to the scope of the journal in which it was published in. This evaluation exposes the gaps within published research of certain disciplines of forensic science as well as the trends observed throughout the fifty-three journals reviewed. Additionally, the comparison of publications in 2018 versus 2021 will also display trends and shifts within the focus of forensic science research.

Forensic science journals are produced and published all over the world. Establishing where journals have been published allows scientists to learn about how different countries and continents are performing forensic science research. The authors of this review conjectured that geography may affect the retrieval of articles due to the presence of localized databases, affiliations, and resources

respective to overseas publications. Digital access alleviates some of this concern in that interested parties can theoretically gain information from articles outside of their continent of residence with ease. The reality, however, may involve unforeseen barriers that can skew the relative accessibility of literature in the field to different parties globally.

The year that each journal published its first volume was determined for all fifty-three journals included in this review. Forensic science as a discipline has existed for some time, but has changed drastically since the first journal was published. The focus has shifted primarily from law to science, as the origin of the term forensics itself has its roots in the term forum, the equivalent of a modern court in ancient Rome (6). Speaking explicitly on age and accessibility, some journals were found to not have online archives for their older publications. For example, the earliest volume of *Forensic Toxicology* readily available online is Volume 24, published in 2006 (7). However, *The International Journal of Legal Medicine* has all 136 volumes available from 1922 to 2022 (8). The transition from traditional print publishing to online journal archives may, then, have resulted in the loss of some publications from public view.

## Methods

The majority of the information described in this review was obtained directly from the websites of the journals included. The acceptance rates of the journals were obtained by emailing the editors and asking them directly for the information. For those who responded (thirteen were willing to share information by email), editors would self-report the number based on the number of submissions the journal receives versus the number accepted for publication within the same time period. For the content section, categories of content were assigned to articles from 2018 and 2021 for each journal and compared to the general topics reported in the scope of the journal. Each article was placed into its respective category based on examination of the titles and abstracts. Impact factors were retrieved the journal website if reported. If not reported, impact factors were retrieved from Resurchify if available. For indexing, categories were defined as high indexed, moderate indexed, low indexed, or not indexed. Those considered high indexed were found in seven or more databases while journals within the moderate indexed category were found in four to six. Any found in one to three databases were classified as low indexed. Journals were placed in the not indexed category if an index or abstracting service could not be identified.

## Results and Discussion

### *Cost to access and publish*

The fifty-three journals examined in the study fall into one of four categories: hybrid, open access with publication fees, open access without publication fees, and non-open access. Many journals are considered hybrid, which means that articles can be accessed either through open access (paid by the author) or are available through subscription or “pay per article or issue” by the reader (TABLE 2a). Hybrid journals do not require publication fees from authors if they cannot or are unwilling to pay the open access fee. Open access fees range in the thousands of dollars with *Drug Analysis and Testing* having the highest fess at \$4,700 USD (9). Access per issue or article is sometimes time limited. Articles are always freely available from open access journals but authors typically are required to pay for what amounts to a publication fee (TABLE 2b). Some open access journals do not require open access or publication fees from authors (TABLE 2c). Typically, these journals are not affiliated with any major publishing company. Non-open access journals require either a subscription and or offer access through pay for article or issue (TABLE 2d). Journals that are discipline-specific (e.g. bloodstain patterns, document examination) typically are found in the latter two categories.

**TABLE 2a** Hybrid journals (monetary values are USD).

Journal	Cost to Access	Cost for Open Access
American Journal of Forensic Pathology and Medicine	\$47/article purchase	\$2445-3010
Australian Journal of Forensic Sciences	\$55/48 hour access; \$184 issue/30 days access	\$3400
Canadian Society of Forensic Science Journal	\$55/48 hour access; \$89 issue/30 day access	\$3085
Drug Testing and Analysis	\$15/48 hour access; \$25/unlimited access	\$4700
Environmental Forensics	\$55/48 hour access	\$3400
Forensic Chemistry	\$25/95/article purchase	\$3430
Forensic Genomics	\$51/24 hour access	\$3600
Forensic Imaging	\$24.95/48 hour access	\$2500
Forensic Science International	\$37.95/article purchase	\$3710
Forensic Science International: Digital Investigation	\$24.95/article purchase	\$2750
Forensic Science International: Genetics	\$24.95/24 hour access	\$4530
Forensic Science, Medicine and Pathology	\$39.95/article purchase	\$4190

Forensic Toxicology	\$39.95/article purchase	\$4190
International Journal of Legal Medicine	\$39.95/article purchase	\$4190
Journal of Analytical Toxicology	\$40/24 hour access	\$4416
Journal of Forensic and Legal Medicine	\$27.95/article purchase	\$3540
Journal of Forensic Nursing	\$47/article purchase	\$2545-3010
Journal of Forensic Sciences	\$12/48 hour access, \$48/article purchase	\$4000
Legal Medicine	\$24.95/article purchase	\$3000
Science and Justice	\$27.95/48 hour access per article	\$3610
Spanish Journal of Legal Medicine	\$24.95/48 hour access	\$700-2100

**TABLE 2b** Open access journals with publication fees (monetary values are USD except for RJLM).

Journal	Publication Fee
Forensic Science International: Animals and Environments	\$1700
Forensic Science International: Genetics Supplement Series	\$3090
Forensic Science International: Mind and Law	\$1700
Forensic Science International: Reports	\$650
Forensic Science International: Synergy	\$1700
Forensic Sciences Research	\$1500
Forensic Sciences	\$2068
PLOS ONE (DNA only)	\$800-1805
Romanian Journal of Legal Medicine (RJLM)	\$300 Euros
WIREs Forensic Science	\$4300

**TABLE 2c** Open access journals without publication fee.

Arab Journal of Forensic Sciences and Forensic Medicine
Association for Crime Scene Reconstruction Journal: The Scene
Brazilian Journal of Forensic Sciences, Medical Law, and Bioethics
Croatian Medical Journal (DNA only)
Egyptian Journal of Forensic Sciences
Forensic Science Journal (Taiwan)
Journal of American Society of Trace Evidence Examiners
Journal of Bloodstain Pattern Analysis
Journal of Forensic Science Education
Journal of the National Academy of

Forensic Engineers
Malaysian Journal of Forensic Science
Microgram Journal (defunct)
Problems of Forensic Science
Scandinavian Journal of Forensic Science

**TABLE 2d** Non-open access journals.

Journal	Cost to Access
Academic Forensic Pathology	\$41/24 hour access
Forensic Science Review	\$30/article student \$60/article individual; \$80/article institution
Journal of American Society of Questioned Document Examiners	\$95 yearly subscription (on-line), \$165 (print)
Journal of Firearms and Tool Mark Examiners (AFTE)	\$150 annual subscription (on-line of print); \$50/issue
Journal of Forensic Document Examination	Issue purchase \$27.95-60
Journal of Forensic Identification	\$205 yearly subscription
Medicine, Science, and the Law	\$41.50/24 hour access per article; \$285.5/ 24 hour access for issue
The Microscope	\$66/annual subscription

*Impact Factor and Acceptance Rate*

Of the fifty-three journals chosen for this paper, impact factors could only be located for twenty-eight of them through self-reporting on journal websites or through Resurichify (TABLE 3). Although the importance of impact factors is often in dispute (10), it is likely that professionals and students seeking information on a topic and more likely to find articles on the subject from journals with high impact factors particularly if looking through reference lists on publications. Acceptance rates and impact factors appear not to be linked thus limiting the determination of quality based on impact factor. Some journals with higher impact factors (e.g. Forensic Chemistry, Forensic Sciences Research, Journal of Analytical Toxicology) (11-13) have higher acceptance rates than some journals with lower impact factors (e.g. Australian Journal of Forensic Science, Canadian Journal of Forensic Science) (14-15). Many journals were unwilling to disclose or did not know their acceptance rates. Some journals factor in author withdrawals or incomplete submissions in the calculation of acceptance rate.

**TABLE 3** Journals ranked by impact factor.

Journal	Impact Factor	Acceptance Rate (%)
Forensic Science International: Genetics	4.88	NR
Forensic Science Research	3.79	39
PLOS ONE	3.58	NR
Journal of Analytical Toxicology	3.36	41
Drug Testing and Analysis	3.26	NR
International Journal of Legal Medicine	2.79	NR
Forensic Chemistry	2.67	50
Forensic Science International” Genetics Supplement Series	2.67	100*
Forensic Toxicology	2.54	35
Forensic Science, Medicine, and Pathology	2.45	35
Forensic Science International	2.39	27
Forensic Science International: Synergy	2.04	NR
Legal Medicine	2.02	28
Science and Justice	1.99	30
Journal of Forensic Sciences	1.83	NR
Forensic Science International: Digital Investigation	1.81	26
Croatian Medical Journal	1.64	NR
Journal of Forensic and Legal Medicine	1.61	20
Environmental Forensics	1.33	NR
Forensic Science International: Mind and Law	1.31	NR
Medicine, Science and the Law	1.26	NR
Australian Journal of Forensic Sciences	1.17	23
Forensic Science Review	1.10	100*
Forensic Imaging	1.05	NR
Journal of Forensic Nursing	0.89	52
Forensic Science International: Reports	0.88	NR
Egyptian Journal of Forensic Sciences	0.87	NR
Journal of Forensic Identification	0.45	NR
Canadian Society of Forensic Science Journal	0.40	25
Romanian Journal of Legal Medicine	0.26	NR
Academic Forensic Pathology	0.24	NR
Journal of Forensic Document	0.13	NR

Examination		
Journal of Firearms and Toolmark Examiners	0.03	NR
Scandinavian Journal of Forensic Science	NR	70
Journal of National Academy of Forensic Engineers	NR	40
Spanish Journal of Legal Medicine	NR	45
Journal of American Society of Questioned Document Examiners	NR	50
Brazilian Journal of Forensic Sciences, Medical Law, and Bioethics	NR	68
Problems of Forensic Science	NR	68
Forensic Genomics	NR	70
Journal of Forensic Science Education	NR	94
The Microscope	NR	90
Forensic Science International: Animals and Environments	NR	NR
Forensic Sciences	NR	NR
Journal of Bloodstain Pattern Analysis	NR	NR

\*Forensic Science Review and Forensic Science International: Genetics Supplement Series is by invitation to publish  
NR=not reported

*Indexing and Abstracting*

Indexing and abstracting in various searchable databases allows for the student and professional to locate articles on a particular subject. The greater the amount of indexing, the greater the likelihood of finding a particular article. Across the fifty-three journals examined for this study, indexing varied widely. For reporting purposes, journals as defined as high indexed, moderate indexed, and low indexed based upon the number of databases indexing articles from each journal. In most cases, indexing and abstracting are listed on each journal’s website. For those that are not, the authors attempted to locate articles from these journals in accessible databases (the authors recognize that some journals may be in databases that the authors just did not find). It is important to note that the indexing classifications do not refer to the quality or relative usage of these databases, only to the number. Additionally, there is a separate category for those journals whose articles are only available on their own exclusive website, a category that seven journals surveyed for this study belong to. As shown in **TABLE 4**, eleven journals were found to be in the high index category, fourteen belong to the moderate index category, and twenty-one were found to be in the low index category. In total, the data shows that the

majority of the journals are indexed in three or less databases.

Some databases appeared more often than others in the index lists. Among the most common were Chemical Abstracts, Directory of Open Access Journals, EBSCO, EMBASE, Google Scholar, Proquest, Pubmed, Science Citation Index, SciFinder, and Scopus,. Major publishers such as Elsevier, Springer, and Wiley typically have their own search databases for their journals (e.g. Science Direct for Elsevier). In some instances, databases are particular to a particular geographical region (e.g. Canadian Serials Directory provides indexing for the *Canadian Society of Forensic Science Journal*). Additionally, there is variation within larger journal families, as seen with the *Forensic Science International* journals (16-23). They are distributed between the moderate and low index categories with the exception of the flagship journal which is listed in the high indexed category.

**TABLE 4** Indexing and abstracting of forensic science journals.

**High Indexed Journals**

Australian Journal of Forensic
Canadian Society of Forensic Science Journal
Forensic Science International
Forensic Science, Medicine and Pathology
Forensic Toxicology
International Journal of Legal Medicine
Journal of Forensic and Legal Medicine
Journal of Forensic Sciences
Legal Medicine
PLOS ONE
Problems of Forensic Science

**Moderate Indexed Journals**

American Journal of Forensic Pathology and Medicine
Brazilian Journal of Forensic Sciences, Medical Law, and Bioethics
Drug Testing and Analysis
Forensic Chemistry
Forensic Genomics
Forensic Science International: Genetics
Forensic Science International: Synergy
Forensic Science Research
Forensic Sciences
Journal of Analytical Toxicology
Medicine, Science, and the Law
Scandinavian Journal of Forensic Science
Science and Justice
Spanish Journal of Legal Medicine

**Low Indexed Journals**

Academic Forensic Pathology
Croatian Medical Journal

Egyptian Journal of Forensic Sciences
Environmental Forensics
Forensic Imaging
Forensic Science International: Animals and Environments
Forensic Science International: Digital Investigation
Forensic Science International: Genetics Supplement Series
Forensic Science International: Mind and Law
Forensic Science International: Reports
Forensic Science Review
Journal of Firearms and Tool Mark Examiners
Journal of Forensic Document Examination
Journal of Forensic Identification
Journal of Forensic Nursing
Journal of Forensic Science Education
Journal of the National Academy of Forensic Engineers
Microgram Journal
Romanian Journal of Legal Medicine
The Microscope
WIREs Forensic Science

**Not Indexed**

Arab Journal of Forensic Sciences and Forensic Medicine
Association for Crime Scene Reconstruction Journal: The Scene
Forensic Science Journal (Taiwan)
Journal of American Society of Questioned Document Examiners
Journal of American Society of Trace Evidence Examiners
Journal of Bloodstain Pattern Analysis
Malaysian Journal of Forensic Science

*Publication frequency*

Primarily, the journals surveyed are published quarterly. Of the fifty-three journals surveyed, eighteen follow this publication pattern. Ten journals publish six times a year (including *Forensic Chemistry* which publishes five times per year) (11) and four active journals publish between eight and twelve issues annually (*Drug Analysis and Testing* and *Forensic Science International* publish monthly) (9, 16). Twelve journals publish either one issue annually or use a continuous publication model. These are primarily open access journals such as the *Journal of American Society of Trace Evidence Examiners*, *Association of Crime Scene Reconstruction Journal*, and *PLOS ONE* (24-26). There does seem to be some correlation between publication frequency and impact factor. Of the top fifteen highest impact factor journals listed in **TABLE 3**, eight publish at least five issues annually. Of the other

seven journals, two publish four times per year (*Forensic Sciences Research* and *Forensic Science, Medicine, and Pathology*) (11, 27), three use a continuous publication model (*Forensic Science International: Synergy* and *PLOS ONE*) (18, 26), and one (*Forensic Science International: Genetics Supplement Series*) publishes by invitation only (21). The only anomaly in this group is *Forensic Toxicology* which publishes only twice each year (27).

*Publisher and Affiliation*

The publisher of the journals surveyed also affects access. Journals with well-known publishers are likely to be better indexed and typically have their own search engines that are often found in library systems (e.g. Science Direct for Elsevier; SpringerLink, Wiley Online). Of the fifty-three journals examined, thirty-two have major academic publishers. This group includes fourteen from Elsevier, four each from Springer and Taylor and Francis, three from Wiley, and two each from SAGE and Wolterskluwer. Of the twenty-five high and moderate indexed journals listed in **TABLE 4**, twenty-one have a major publisher. Similarly, major publishers account for fourteen of the fifteen journals with the highest impact factor listed in **TABLE 3**. The one that does not is *PLOS ONE* which is published through the Library of Science which is also highly indexed and accessible but differs from the other publishers since it is a non-profit organization (26). The one commonality among journals in this group is that they are either hybrid or open access with a publication fee. Conversely, of the thirteen active open access journals without a publication fee listed in **TABLE 2c**, twelve do not have a recognized publisher (the one exception is the *Egyptian Journal of Forensic Sciences* which is a Springer Open journal (28). Although articles in these journals are freely accessible, they tend to be low indexed and show low impact factors.

Journal distribution and access is often associated with professional organization affiliation. Most of the journals in this study are affiliated with a forensic science professional organization (**TABLE 5**). In some cases, professional organizations offer access for their members to the official journal or publication of the organization. For instance, the American Academy of Forensic Sciences offers access to *the Journal of Forensic Sciences* to its members (29). Similarly, the International Association for Identification offers access to the *Journal of Forensic Identification* to its members as does the American Society of Questioned Document Examiners which offers access to members to their journal. At the very least, members of organizations will likely be more aware of the group’s official publication leading to increased journal visibility. Unfortunately, this may not be an option for students in academic programs although in some instances, student members of professional

forensic science organizations are allowed access to the group’s sponsored journal (this is the case with the Chartered Society of Forensic Sciences which serves as the parent organization for *Science and Justice*) (32).

**TABLE 5** Journals with forensic science professional affiliation.

<b>Journal</b>	<b>Affiliation</b>
Academic Forensic Pathology	National Association of Medical Examiners Foundation
American Journal of Forensic Pathology and Medicine	National Association of Medical Examiners
Arab Journal of Forensic Sciences and Medicine	Arab Society for Forensic Sciences
Association for Crime Scene Reconstruction Journal	Association for Crime Scene Reconstruction
Australian Journal of Forensic Sciences	Australian Academy of Forensic Sciences
Brazilian Journal of Forensic Sciences, Medical Law, and Bioethics	Instituto Paulista de Estudos Bioéticos e Jurídicos
Canadian Society of Forensic Science Journal	Canadian Society of Forensic Science
Egyptian Journal of Forensic Sciences	International Association of Law and Forensic Sciences
Environmental Forensics	Association for Environmental Health and Sciences foundation/ International Society of Environmental Forensics
Forensic Chemistry	American Society of Crime Lab Directors
Forensic Genomics	International Symposium on Human Identification
Forensic Imaging	International Society of Radiology and Imaging/ International Association of Forensic Radiographers
Forensic Science International: Genetics	International Society for Forensic Genetics
Forensic Science International: Genetics Supplement Series	International Society for Forensic Genetics
Forensic Science International: Digital Investigation	Digital Forensic Research Conference
Forensic Science International: Synergy	American Society of Crime Lab Directors
Forensic Science Journal	Academy of Forensic Science
Forensic Sciences	Portuguese Association of Forensic Sciences



Forensic Toxicology	Japanese Association of Forensic Toxicology
International Journal of Legal Medicine	International Academy of Legal Medicine
Journal of American Society of Questioned Document Examiners	American Society of Questioned Document Examiners
Journal of American Society of Trace Evidence Examiners	American Society of Trace Evidence Examiners
Journal of Analytical Toxicology	The International Association of Forensic Toxicologists (TIAFT)/Society of Forensic Toxicologists
Journal of Bloodstain Pattern Analysis	International Association of Bloodstain Pattern Analysts
Journal of Firearms and Toolmarks Examiners	Association of Firearms and Toolmark Examiners
Journal of Forensic and Legal Medicine	Faculty of Forensic and Legal Medicine
Journal of Forensic Document Examiners	Association of Forensic Document Examiners
Journal of Forensic Identification	International Association for Identification
Journal of Forensic Nurses	International Association of Forensic Nurses
Journal of Forensic Science Education	Council of Forensic Science Educators
Journal of Forensic Sciences	American Academy of Forensic Sciences
Journal of National Academy of Forensic Engineers	National Academy of Forensic Engineers
Legal Medicine	Japanese Society of Legal Medicine
Medicine, Science, and the Law	British Academy for Forensic Sciences
Malaysian Journal of Forensic Science	Forensic Science Society of Malaysia
Microgram Journal	Drug Enforcement Administration
Problems of Forensic Science	Institute of Forensic Expertise
Romanian Journal of Legal Medicine	Romanian Society of Legal Medicine
Scandinavian Journal of Legal Medicine	Danish, Norwegian, and the Swedish Societies for Forensic Medicine
Science and Justice	Chartered Society of Forensic Sciences
Spanish Journal of Legal Medicine	National Association of Forensic Physicians
The Microscope	McCrone Research Institute

*Content*

The authors examined subject matter of papers published in the surveyed journal in two years: 2018 (pre-pandemic) and 2021 (post-pandemic). In these two years, 6,115 forensic science-themed articles were published in the fifty-three journals. The content of some articles could be classified into one or more subject areas creating a dataset of seven thousand three hundred and fifty articles. The forensic science disciplines most prevalent during these two years include forensic biology, forensic chemistry and environmental forensics, forensic pathology, medicine, and nursing, and toxicology. All four of these areas showed percentages above 8% for both years. The amount of papers in both years appears to be balanced for most disciplines with only questioned document examination and wildlife forensics underrepresented (**TABLE 6**).

**TABLE 6** Percent articles published according to forensic science discipline in 2018 and 2021.

Discipline	2018	2021
<b>Crime Scene Investigation</b>	4.4	4.5
<b>Digital Forensics</b>	5.3	4.8
<b>Forensic Anthropology</b>	5.8	7.0
<b>Forensic Biology</b>	9.5	9.1
<b>Forensic Chemistry and Environmental Forensics</b>	8.3	8.4
<b>Forensic Science Administration and Education</b>	7.6	5.1
<b>Forensic Engineering</b>	1.9	3.3
<b>Forensic Entomology</b>	4.7	4.0
<b>Forensic Odontology</b>	4.7	6.1
<b>Forensic Pathology, Medicine, and Nursing</b>	9.9	9.2
<b>Jurisprudence</b>	5.9	5.5
<b>Pattern Analysis</b>	6.5	6.3
<b>Forensic Psychology</b>	6.5	6.3
<b>Questioned Document Examination</b>	2.7	3.9
<b>Toxicology</b>	8.4	8.8
<b>Trace Evidence</b>	6.5	6/6
<b>Wildlife Forensics</b>	1.4	2.0

Of the fifty forensic journals in this study (excluding PLOS ONE, Croatian Medical Journal, and The Microscope which are not by definition forensic journals), fourteen have forensic pathology as the main focus (*Academic Forensic Pathology; American Journal of Forensic Pathology and Medicine; Arab Journal of Forensic Sciences and Medicine; Brazilian Journal of Forensic Sciences, Medical Law, and Bioethics; Egyptian Journal of Forensic Science; Forensic Imaging; Forensic Science, Medicine, and Pathology; International Journal of Legal Medicine; Journal of*

*Forensic and Legal Medicine; Legal Medicine; Medicine, Science, and the Law; Romanian Journal of Legal Medicine; Scandinavian Journal of Forensic Science; Spanish Journal of Legal Medicine*) (8, 27-28, 33-43). Although papers dealing with forensic pathology and medicine primarily are found in these journals, papers from other disciplines that have death investigation as a focus can be found in these journals (e.g. anthropology, forensic biology, odontology, psychology, and toxicology). Of the other thirty-six journals, twenty-one are discipline specific, two focus on review articles of topical interest (*Forensic Science Review, WIREs Forensic Science*) (44-45), and twelve are classified as wide-scope covering a wide-range of forensic science topics (TABLE 7). Finally, *Forensic Science International: Synergy* encompasses a unique space since it offers an interdisciplinary approach to research and forensic science policy and management (18).

**TABLE 7** Wide-scope forensic science journals.

Australian Journal of Forensic Sciences
Canadian Society of Forensic Science Journal
Forensic Science International
Forensic Science International: Reports
Forensic Science Journal
Forensic Science Reports
Forensic Sciences
Journal of Forensic Identification
Journal of Forensic Sciences
Malaysian Journal of Forensic Science
Problems of Forensic Science
Science and Justice

#### *Geography and Age*

The journals comprising the master list of fifty-three journals come from six continents: Africa, Oceania, and South America contain the *Egyptian Journal of Forensic Sciences*, *Australian Journal of Forensic Sciences*, and the *Brazilian Journal of Forensic Sciences*, *Medical Law*, and *Bioethics* respectively (14, 28, 36). Asia contains six journals including the *Arab Journal of Forensic Sciences and Forensic Medicine*, *Forensic Science Journal*, *Forensic Science Review*, *Forensic Toxicology*, *Legal Medicine*, and the *Malaysian Journal of Forensic Science* (7, 34, 39, 44, 46, 47). The remaining forty-three journals are published in either North America or Europe. Of these forty-three journals some have a more explicit geographical focus such as *American Journal of Forensic Pathology and Medicine* (United States); *Canadian Society of Forensic Science Journal; Medicine, Science, and the Law* (Great Britain); *Problems of Forensic Science* (Poland); *Romanian Journal of Legal Medicine;*

and the *Scandinavian Journal of Forensic Science* (15, 34, 40, 41, 42, 48). Conversely, others claim a more international focus (*Forensic Science International, International Journal of Legal Medicine, Journal of Forensic Identification*) (8, 16, 30). Although the *Journal of Forensic Sciences* is the official publication of the American Academy of Forensic Sciences its authorship is clearly international (29).

The earliest published journal on the list published its first issue in 1922 (*International Journal of Legal Medicine*) (8) and the last journal to begin publishing was in 2021 (*Forensic Sciences, Forensic Genomics*) (49, 50). Of the fifty-three journals surveyed, more than one-quarter of them began publishing in the 2000's clearly demonstrating the increased interest in forensic science over the last few decades. Most of these journals have a discipline-specific focus (such as the *Journal of the American Society of Trace Evidence Examiners* in 2010) (24) which as a trend started in the 1970's with the creation of such journals as the *Journal of Analytical Toxicology*, and the *Journal of Forensic Document Examination* during this period (13, 51).

#### **Conclusion**

Nearly half of the journals surveyed in this study are freely accessible to students and practitioners. (24 of 53). However, since most of these journals are poorly indexed (only seven are defined as having moderate to high indexing including PLOS ONE which is not a forensic science journal), it may be difficult to locate papers from these journals unless those interested search directly on the journal website. In addition, nineteen of these journals have impact factors that are unknown or are below 1.00, meaning that their work is not being cited by other authors to any appreciable degree. This is not to presume that papers in these journals have diminished quality considering that all of them undergo the peer review process prior to publication. It is simply a question of dissemination. It is likely that most articles will be retrieved through mostly hybrid journals since these journals are better indexed and are more easily found. Access to these journals however requires an agency or school subscription. Without a subscription, costs for individual papers or articles can be high with some requiring more that \$50 USD for limited time access. Agencies/schools with comprehensive subscription to major publishers may also find that these subscriptions are often limited to certain journals and articles thus requiring fee to access for parts of their journal and article inventory.

Simple knowledge of the existence of journals likely plays a role in the dissemination of articles. Journals that are newer or not associated with a major publisher always run the risk of "flying under the radar." Without a major publisher, journals may not be widely indexed.

Even long standing freely accessed journals may not find their way into reference lists in papers and textbooks if they are not suitably indexed. Unless costs are paid by the author for open access, it thus appears that the availability of many articles sought by students and practitioners will incur cost to the person or agency.

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