

**Special Report**

**Stroke Journal**

What Is Being Published to Advance the Field?

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Stroke is a monthly peer-reviewed journal that just celebrated its 42nd publication year. Its target audience is broad, including general practitioners, general and vascular neurologists, basic scientists, cardiologists, vascular surgeons, internists, interventional radiologist, neurosurgeons, physiatrists, and stroke rehabilitation experts. Stroke publishes 12 monthly editions per year comprising ≈3500 pages per year, and it is indexed in Biosciences Information Service, Current Awareness in Biological Sciences, Chemical Abstracts, Cumulative Index Nursing and Allied Health Literature, Current Contents, Excerpta Medica database, and MEDLINE. It publishes ≈30 original research articles, 8 brief reports, and 5 other types of articles in each issue, ≈100% of its content related to the field of cerebrovascular diseases. Other neurology journals only publish ≤15% of their content related to cerebrovascular disease.1,2

Peer-reviewed publications are an important component of academic activity, as it constitutes a form of feedback to authors by qualified colleagues with expertise in a specific field and provides readers with up-to-date information. Peer-reviewed publications are also used to maintain standards of quality, evaluate academic performance, and are an essential part of the dissemination of research, describing innovative interventions and discoveries in clinical and basic science.3

Stroke is considered the most important peer-reviewed journal in the area of cerebrovascular disorders, ranking number 7 among 185 journals in the Clinical Neurology category (2010 Journal Citation Reports Thomson Reuters, 2011).

Limited information is available on what is being published in Stroke. A better understanding of common topics and factors influencing the acceptance rate would not only be informative for Stroke readers, but also be helpful for authors when submitting a new article and for editors when making decisions. Our aims were (1) to provide a comprehensive review of most common topics published in Stroke, (2) to compare acceptance rate by different subject categories (eg, ischemic stroke, intracerebral hemorrhage, etc), and (3) to evaluate whether editorial changes in the processing of new articles affected the time to publication.

**Methods**

We used the Stroke journal database to analyze all submissions from January 2004 to December 2011. As part of the general editorial process, submitted articles are checked in by staff. Once an article passes check in, it is assigned to a handling editor for initial evaluation. If the handling editor decides to send an article for review, he or she selects potential reviewers with appropriate expertise. Staff contacts the potential reviewers until the desired number of reviewers is obtained. When the reviews are returned, the handling editor considers an article on the basis of quality, originality, scientific rigor, and data presentation. Analysis of an article along with reviewer comments and the overall priority of an article. The handling editor recommends a decision. Staff prepares a draft with reference to decision letter for the editor in chief or senior consulting editor to approve. When the decision is approved, staff sends the letter to the authors.

All noninvited article submissions were considered eligible for the present study, but our evaluation was limited to original contributions (Figure 1). Articles in clinical and basic sciences were included. All new submissions were linked on the basis of article ID to determine the final outcome (eg, accepted, rejected, and resubmit as de novo).

A similar approach was used for articles with recommendation of resubmission after minor or major revisions. A de novo rejection usually indicates that the reviewers considered an article to have some merit but substantial deficiencies were also observed. A de novo rejection affords the authors the opportunity to respond to the concerns of the reviewers by including additional data in an article. The status of each article was followed until September 2012.

Data elements for the present study included article ID, submission date, request revision date, number of requested and accepted reviewers, reviewer’s recommendation, most recent editorial decision, subject codes, key words, article type, decision date, publication online date, publication print date, country, city, and affiliation of the corresponding author. A template of the most relevant fields can be found in the Stroke journal online submission Web site (http://stroke-submit.aha-journals.org). We excluded invited editorials, invited special reports, letters to

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Guest Editor for this article was Bo Norrving, MD.

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Of them, there were 18
Overall, there were 70
Kruskal–Wallis tests were used to compare mean and median differ-
Chi-square test was used to compare categorical variables; ANOV A or
Methods/m49/m49regin.htm; see online-only Data Supplement).
according to the UN region classification (http://unstats.un.org/unsd/}
low faster online and print publications.
and after July 1, 2010, when a triaging system led by a senior editor
altered for the analyses. We compared editorial processing time before
atrial fibrillation remained as a single category. Subject codes were not
vein, and venous thrombosis), and dyslipidemia (including cholesterol,
disease (including coronary artery bypass, cardiac surgery), coagu-
pathy/thrombosis (hypercoagulopathy, thrombosis, sinus thrombosis, vein, and venous thrombosis), and dyslipidemia (including cholesterol,
lipids, and lipoproteins). Hypertension, diabetes mellitus, smoking, and
atrial fibrillation remained as a single category. Subject codes were not
altered for the analyses. We compared editorial processing time before
and after July 1, 2010, when a triaging system led by a senior editor
and 1 reviewer was introduced to allow faster processing of submitted
articles. At that time, the publisher also streamlined its practices to al-
lowed online and print publications.
Information for the corresponding author was used to determine the
city, country, and continent of the submission. Countries were grouped
according to the UN region classification (http://unstats.un.org/unsd/
methods/m49/m49regin.htm; see online-only Data Supplement).
Statistical Analysis
Chi-square test was used to compare categorical variables; ANOVA or
Kruskal–Wallis tests were used to compare mean and median differ-
cences for continuous variables. Linear regression analysis was used to
determine the association between editorial changes with time to
final decision and publication. Logistic regression analysis was used to
assess the association between country and region of origin and top
10 key words with acceptance rate.
Statistical analysis was performed using STATA version 9
(StataCorp LP, College Station, TX). All tests were 2 tailed, and P
values <0.05 were considered significant. The protocol was approved
by the Stroke Editorial Office and the American Heart Association.

Results
Overall, there were 70,333 records during the study period.
Of them, there were 18,072 unique submitted articles after
eliminating duplicates. After excluding case reports, research
letters, invited and uninvited reviews, and brief communications
(n=3123; 17.3%), 14,949 original contributions represented
the final sample for the present analysis (Figure 1).

There was a trend toward an increased number of articles
submitted per year since 2004 (P<0.001; Figure 2). The num-
ber of submitted original articles is increased by 45%, from
118 per month in 2004 to a monthly average of 171 in the most
recent years. The most common countries of origin were the
United States, Japan, and Germany (Table 1). The most com-
mon continents for submissions were Europe (36.8%), fol-
lowed by North-America (29.2%) and Asia (22.9%; Table 2).
Only a small proportion of submissions originated from coun-
tries in Latin-America/Caribbean (1.2%) or Africa (0.4%).
There was an increased trend in the number of submissions
from Asia, Africa, and Latin-America (ranging from 21.6% in
2004 to 27.8% in 2011; P<0.001).

The overall acceptance rate for original contributions was
21.1%, ranging from 18.2% (2009) to 24.3% (2006). There
was a significant variability in the acceptance rate by conti-
nent (Table 2), North-America having the highest rate (30.6%)
and Africa (9.3%) the lowest one. Number of submissions,
acceptance rate, and odds of acceptance for the top 10 coun-
tries where original contributions originated are summarized
in Table 1. Table 2 summarizes the same metrics by continent.

There was no difference in the acceptance rate by month
or season (eg, editorial decisions made: from June to August:
odds ratio [OR], 0.98; 95% confidence interval [CI], 0.90–
1.08, P=0.73; from January to March: OR, 0.97; 95% CI,
0.89–1.06, P=0.53; decisions made during the Christmas/New Year: OR, 0.90; 95% CI, 0.71–1.14, P=0.39).

Of the 14,949 submitted original contributions, 2284
(15.3%) articles were initially rejected, but invited to resubmit
as new submission called de novo. Of them, 15 (0.66%) arti-
cles were either not resubmitted or unable to match with the
original submission number, leaving 2269 articles resubmitted
as de novo with a final editorial decision. The acceptance rate
for those selected articles resubmitted as de novo was 78.8% (1789/2269).

**Time From Submission to Editorial Decision and Publication**

The mean (SD) time from submission to first editorial decision was 41.4 (±33) days. The mean time from submission to online and print publication for accepted articles was 174.2 (±64) days and 201.8 (±64) days, respectively. No significant difference was observed in the decision time by United Nations region or by country. Overall, there was a significant reduction in the time from submission to first decision after the implementation of the editorial changes on July 1, 2010 (43 days before versus 36 days after; \( P<0.0001 \)). The regression analysis showed a 6-day reduction in the time to first editorial decision (−6.24; 95% CI, −7.5 to −4.93) after the implementation of editorial changes. Similarly, there was a significant reduction in the time from editorial decision to online (121 days versus 86 days; mean difference, 35 days; \( P<0.0001 \)) and print (134 versus 125 days; mean difference, 9 days; \( P<0.0001 \)) publication after 2010 for accepted articles (Figure 3). For each article, a mean of 4.2 reviewers was invited to participate in the Stroke journal review process. One third of invited reviewers (34.2%) either declined or did not participate in the review process.

**The Top 10 Topics**

The top 10 topics (identified from key words) for all original contributions and for the accepted articles are represented in Figure 4A and 4B. There were similarities in the most

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**Table 1. Top 10 Countries of Origin for Submitted Articles and Acceptance Rate**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Number of Submissions</th>
<th>Number of Accepted Articles</th>
<th>Acceptance Rate</th>
<th>OR (95% CI) for Acceptance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>3723</td>
<td>1156</td>
<td>31.1</td>
<td>2.07 (1.90–2.25)</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>1306</td>
<td>165</td>
<td>12.6</td>
<td>0.51 (0.43–0.61)</td>
</tr>
<tr>
<td>3</td>
<td>Germany</td>
<td>1102</td>
<td>254</td>
<td>23.1</td>
<td>1.13 (0.97–1.30)</td>
</tr>
<tr>
<td>4</td>
<td>United Kingdom</td>
<td>880</td>
<td>242</td>
<td>27.5</td>
<td>1.45 (1.24–1.69)</td>
</tr>
<tr>
<td>5</td>
<td>Canada</td>
<td>642</td>
<td>178</td>
<td>27.7</td>
<td>1.45 (1.22–1.74)</td>
</tr>
<tr>
<td>6</td>
<td>Netherlands</td>
<td>608</td>
<td>142</td>
<td>23.4</td>
<td>1.14 (0.94–1.38)</td>
</tr>
<tr>
<td>7</td>
<td>Korea, Republic of</td>
<td>568</td>
<td>57</td>
<td>10.0</td>
<td>0.41 (0.31–0.53)</td>
</tr>
<tr>
<td>8</td>
<td>China</td>
<td>563</td>
<td>42</td>
<td>7.5</td>
<td>0.29 (0.21–0.40)</td>
</tr>
<tr>
<td>9</td>
<td>Italy</td>
<td>520</td>
<td>74</td>
<td>14.2</td>
<td>0.61 (0.48–0.78)</td>
</tr>
<tr>
<td>10</td>
<td>France</td>
<td>489</td>
<td>118</td>
<td>24.1</td>
<td>1.19 (0.97–1.47)</td>
</tr>
<tr>
<td>Total</td>
<td>Top 10 countries</td>
<td>10 401</td>
<td>2428</td>
<td>23.3</td>
<td>1.44 (1.31–1.58)</td>
</tr>
</tbody>
</table>

Acceptance rate estimated from number of accepted original contributions/number of submitted original contributions. CI indicates confidence interval; and OR, odds ratio.

*Derived from logistic regression analysis comparing the country odds with the average acceptance.
common topics among the submitted and accepted articles. However, rehabilitation was within the top 10 topics of submitted articles, whereas animal models were in the top 10 list of accepted original contributions.

Among the top 10 key words for all submitted original contributions, epidemiology (OR, 1.54; 95% CI, 1.36–1.75), thrombolysis (OR, 1.53; 95% CI, 1.32–1.57), risk factors (OR, 1.29; 95% CI, 1.13–1.47) were the only topics associated with a higher acceptance rate. Contrarily, rehabilitation (OR, 0.76; 95% CI, 0.62–0.92) was less likely associated with acceptance.

A subgroup analysis revealed a low selection of specific key words for common vascular risk factors. For example, only 467 (3.1%) of submitted articles selected hypertension, 320 (2.1%) selected coagulation/thrombosis, 263 (1.8%) selected atrial fibrillation, 246 (1.6%) selected cholesterol/lipids/low density lipoproteins, 243 (1.6%) selected diabetes mellitus, and 86 (0.6%) chose smoking.

Ischemic stroke (46.5%) was the most common selected topic and stroke subtype, followed by intracerebral hemorrhage (9.4%) and subarachnoid hemorrhage (8.2%). A miscellaneous category (not including ischemic or hemorrhagic stroke) represented 35.8%. Articles submitted to the basic science section were more likely to be accepted (OR, 1.19; 95% CI, 1.08–1.33) compared with original contributions submitted to other sections.

Discussion

Peer-reviewed publications are the means of dissemination of new knowledge for scientific progress. Furthermore, they constitute one of the most important elements in determining the allocation of career rewards and public resources. For editors, publishers, and journals, publications represent a means of communication with clinicians, stakeholders, advertisement companies, and readers.

The present article is the first report about what is being published in Stroke, the most important journal in the field of cerebrovascular diseases. We found that acute stroke, brain ischemia, outcomes, and epidemiology were the most common submitted topics identified from key words selected by the authors. The most common countries of origin were the United States, Japan, and Germany. We found that among continents Europe contributed the most. We found a modest, but significant reduction in the total time from submission to print publication between articles submitted and accepted before and after 2010 (P<0.001) and 20% to 30% reduction in the time from submission to publication after the implementation of a new editorial system. The mean acceptance rate during the studied period was 21%. Interestingly, 1.27% and 0.38% of submissions originated from Latin-America and Africa, respectively. Both regions were also ranked in the lowest acceptance rate (12.4% and 9.3%) category.
Our findings provide general information about the direction of research and most common topics studied in the field of cerebrovascular disease. The observed consistent disparity between lower submissions and acceptance rates for articles from Africa and Latin-America could be related to the smaller number of researchers and clinician-scientist, and limited exposure to research training in these regions. Regional constraints (eg, research training, research funding) may also limit research initiatives, thus explaining the parallel lower submissions and acceptance rates. A recent study found that only 4% of publications in health policy and system research were led by authors from low-income countries. Previous studies also reported the paucity of randomized studies addressing noncommunicable diseases (eg, stroke) in low- and middle-income countries. The growth of the proportion of submissions may be related to increased stroke awareness in these areas.

The higher submission and publication rates from European countries have also been documented in a previous study analyzing peer-reviewed publications after submissions to the 2000 International Stroke Conference. Multivariate logistic regression analysis showed that oral presentations, university affiliation, and European region of origin were associated with full publications.
There were some topics among all original submissions that were associated with higher probability of acceptance. For example, epidemiology, thrombolysis, and risk factors were associated with a 54%, 53%, and a 29% higher chance of acceptance, respectively. Interestingly, these 3 topics, among others, represent areas of significant advances in cerebrovascular disease occurred in the past decade.15–18

The lower acceptance for submissions using rehabilitation as a key word is an interesting finding considering rehabilitation ranked in the top 10 topics among submitted articles. It is uncertain whether the high clinical demands limited formal training in research methods among physicians devoted to stroke rehabilitation, the small number of randomized trials with modest patient numbers related to lower research dollars available for stroke rehabilitation, or the lower priority scores given by reviewers for those submissions explain these findings.

The present study has some limitations and strengths. First, the scope of this study only includes original contributions. No information is provided on invited submissions, reviews, or case reports. Second, country of origin was defined according to the corresponding author. It is possible that a different approach (eg, senior author) might have influenced our results.

Strengths of our study include a comprehensive analysis of all original contributions submitted to Stroke >8 years. This study represents the first report providing information of what is being published in the most commonly cited journal in the field. Furthermore, it reveals the importance of having access to a comprehensive journal database containing useful information on the review process and editorial decisions relevant for Stroke readers, authors, reviewers, and editors.

There is a need for more information on editorial decisions and the review process.19 Previous studies suggest a poor agreement between reviewers (κ ranging, 0.08–0.28), but reviewers had a strong influence on editorial decisions (likelihood of publication odds ratio ranging from 51 to 73).20 Publication bias in acute stroke trials and issues on conflict of interest for authors of practice guidelines have also been raised.21,22 Despite the available evidence, medical journals offer limited information on editorial decisions and peer-review processes to their readers. A better understanding of the usual timelines, most commonly published topics, and editorial decisions provides transparency of these processes and can lead to a more effective peer review process, which in turn, may lead to relevant publications and innovative advancements to the field of cerebrovascular diseases.

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Disclosures
Dr Saposnik is supported in part by Distinguished Clinician-Scientist Award from the Heart and Stroke Foundation of Canada. The other authors report no conflicts.

References
Supplemental Material
### e-Table I: Countries per continent grouped according to the United Nations (UN) region classification

<table>
<thead>
<tr>
<th>Continent</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>Uganda, Zambia, Chad, Democratic Republic of the Congo, Egypt, Morocco, Tunisia, South Africa, Swaziland, Nigeria, Senegal, Cameroon, Comoros, Madagascar, Malawi</td>
</tr>
<tr>
<td>Oceania</td>
<td>Australia, New Zealand, Vanuatu, Guam, Palau</td>
</tr>
<tr>
<td>North America</td>
<td>Canada, Greenland, United States of America</td>
</tr>
<tr>
<td>Asia</td>
<td>Japan, Republic of Korea, India, Iran-Islamic Republic of, Pakistan, Sri Lanka, Malaysia, Philippines, Singapore, Thailand, Armenia, Bahrain Cyprus, Tajikistan, Uzbekistan, China, Taiwan, Hong Kong, Democratic People's Republic of Korea, Georgia, Iraq, Israel, Jordan, Lebanon, Oman, Qatar, Saudi Arabia, Turkey, Bangladesh, Kuwait</td>
</tr>
<tr>
<td>Europe</td>
<td>Belarus, Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Denmark, Estonia, Finland, Ireland, Norway, Sweden, United Kingdom, Ireland, Bosnia and Herzegovina, Croatia, Greece, Italy, Portugal, Serbia, Slovenia, Spain, Austria, Belgium, France, Germany, Netherlands, Switzerland, Iceland, Lithuania, Ukraine</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>Jamaica, Martinique, Trinidad and Tobago, Mexico, Argentina, Brazil, Chile, Colombia, Bahamas, Ecuador, El Salvador.</td>
</tr>
</tbody>
</table>

Note: Only represented countries for which corresponding authors submitted an original contribution.