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Gender and Geographical Representation on Editorial Board Members of Medical Informatics Journals

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Abstract. Previous work has suggested that gender and geographical distribution (affiliation) of Editors-in-Chief (EiC) and Editorial Board (EB) members are inequitable in representation of scientific communities, and could benefit from increasing diversity of representation. Specifically, previous studies suggest that male and ethnically white (or non-minoritized groups) are overrepresented. Such differences in representation may potentially influence the scientific and scholarly record. This paper aims to build on pre-existing literature by examining the diversity of representation among EiCs and EB members in the top (Q1) journals in the "Medicine-Health Informatics" category (ranked by SCImago Journal and Country Rank, or SJR) in terms of gender as assessed by genderize.io) and geographical distribution of affiliations. Preliminary findings are consistent with those of previous work on the topic: only 25% (8/32) of the EiCs in the selected journals are female, while females only represent 32.7% (426/1303) of the EB members across journals. Furthermore, the US is highly represented in EBs, with more than half of the members, i.e., 52.2% (698/1337), being US-affiliated. Present results suggest the need for an intentional approach to diversifying representation on editorial boards of medical informatics journals. Such intention can be seen as part of a call to action from important stakeholders, including medical informatics leaders and programs, journal management and publishers, and the medical informatics and scientific community more generally.

Keywords. Diversity, equity, inclusivity, editors, editorial board, medical informatics, open access, publishing

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1. Introduction

Some populations of scientists and researchers are underrepresented on editorial boards. Male editors are more often represented than women as Editors-in-Chief and as Associate Editors on Editorial Boards [1,2]; white researchers are more often represented than those of underrepresented or minoritized groups [3]; and researchers in countries of the Global North are more often represented than those of the Global South [3].

In medical journals, 24.4% of editors-in-chief and 27.9% of editorial board members were women in 2021 [4]; in ecology journals, 29% of editors were women in 2015, and women editors more often invited women as reviewers compared to men [5]. In the informatics field, although gender disparities have been identified in the US in award recipients and leadership positions at informatics training programs [6], there is a gap in examining gender proportions among editors of major informatics journals.

Unequal representation of researchers can influence the scientific and scholarly record. We aim to explore the characteristics of Editors in Chief (EiCs) and Editorial Board (EB) members of medical informatics journals in the top 25th percentile (Q1) in SJR in terms of diversity in gender and geographical distribution (affiliation), whilst also examining the journals' Open Access (OA) publishing options. These data could guide efforts in improving diversity, equity, and inclusion (DEI) in informatics publications.

2. Methods

2.1. Data Sources

For data collection, the journals under the category "Medicine-Health Informatics" in the *SCImago Journal and Country Rank* (SJR) index were selected, consisting of the rankings of the journals included in the Scopus database [7] (115 journals in total). SJR is a well-established composite index taking into account not only the number of citations for the journal, but also the impact/prestige of the journals that the citations originated from, i.e., counting and assessing both the number and the quality of citations.

Of these 115 journals, 28 are in the first quartile (Q1) and are included in the present analysis in terms of gender and geographical affiliation of each journal's EiC(s) and EB members. Note that only "Deputy Editors", "Senior Editors", "Section Editors", "Associate Editors", and general EB members were selected.

For gender assignment, we employed genderize.io [8], a tool with an API integration that provides a statistical prediction of gender probability based on a name. For geographical distribution, the respective affiliations in the journal's EB pages were used.

No institutional review board approval or exemption was sought; the collected data were derived from each journal's public website, and the authors de-identified all personal information about gender and geographical affiliations in this manuscript.

2.2. Statistical Analysis

Since this is a preliminary approach, we limited our statistical analysis to demographic characteristics, geographical location of the editors' affiliations, and baseline results about the explored variables of the EB members of the selected journals. Moreover, the Spearman correlations between SJR and percentages of females in EBs are explored.

Last, a breakdown of the selected journals' publishers based on OA options is presented, along with the percentages of "females" in EBs in OA vs. hybrid publishing.

3. Results

3.1. Editors-in-Chief

For these 28 journals, there were 32 EiCs, including co-EiCs. Two journals have two co-EiCs, and one journal has 3 co-EiCs. However, for one of the EiCs we could not retrieve data as to their affiliation (their affiliation was with the journal without a specified geographical location), thus they were excluded from further analysis. In total, 32 EiCs were included in the gender analysis, and 31 in the geographical affiliation analysis. Of the 32 EiCs, 8 (25%) are female and 24 (75%) are male, while, if limiting the analysis to only the top 10 journals, the gender proportion shifts: only 2 of the 10 (20%) journals in the Q1 list have EiCs who are female. For the EiC geographical distribution, 17 (54.8%) are from the United States, followed by China (3), the United Kingdom (2), and 1 in each of the following countries: Australia, Brazil, Canada, France, Germany, Greece, Hong Kong, Israel, Italy. In summary, 18 EiCs have geographical affiliations in North America, 6 in Europe, 5 in Asia, 1 in Oceania, 1 in South America, and 0 in Africa.

3.2. Editorial board Members

Across the 28 journals, 1337 EB members were identified (excluding EiCs). Excluding one journal for which editors could not be identified, 27 remain for analysis. Out of the 1337 included EB members, 877 (67.3%) names had a higher probability of belonging to the category "male" and 426 (32.7%) names of belonging to the category "female" based on genderize.io. For 34 names the result was inconclusive, which is a small number to affect the results thus no manual analysis was performed to determine the genders. Therefore, a total of 1303 EB members were included for the remainder of the analysis.

Figure 1 depicts the EB members' geographical affiliation by country as of March 2nd, 2024. The US represents 52.2% (698 out 1337) of the EB's affiliations, followed by the UK with 8.2% (110/1337) and China with 4.4% (59/1337). Continent-wise, North America is leading with 751 (56.2%) of the Q1 journals EB members' affiliations, followed by Europe with 338 (25.3%), Asia with 157 (11.7%), Oceania with 56 (4.2%), South America with 23 (1.7%), and Africa with 12 (0.9%).

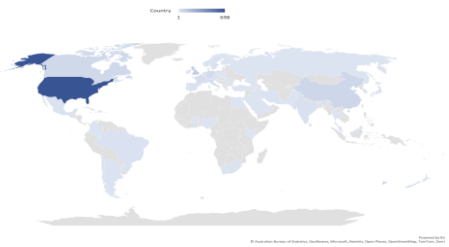

Figure 1. Geographical distribution of the affiliations of the Editorial Board members of the 27 Q1 Journals by country (as of March 2nd, 2024)

For the gender distribution across EBs, we explore the association between the SJR and the percentage of females in the respective journal's EB (absolute numbers differ

across journals thus percentage is more representative). The series are not all normally distributed (Kolmogorov-Smirnov Test of Normality -SJR: D = 0.24771, p = 0.00208; "female": D = 0.09745, p = 0.93787), thus Spearman correlations are calculated.

Figure 2 depicts the box plot of the distribution of the percentages of the two genders between journals (including the outliers). The Spearman rho correlation between the two variables (rs = -0.05831, p (2-tailed) = 0.77265) shows that the association between the two variables is not considered statistically significant, indicating that gender (measured by percentage in the EB) and SJR are not correlated.

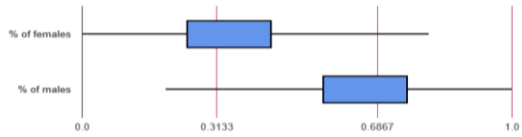

Figure 2. Distribution of the percentages of the two categories, "male" vs. "female", in the 27 Q1 Journals included in the analysis (as of March 2nd, 2024)

3.3. Open Access Journals

Table 1 consists of the OA options for publishers and their gender distribution as of March 2nd, 2024. Only 13 out of the 28 Q1 journals are fully OA. Of the 15 remaining, all offer OA access options (Gold Open Access, Green Open Access, etc.), and none is subscription-only.

Table 1. Open Access options and gender distribution for the top 28 (Q1) ranked by SJR journals in "Medicine-Health Informatics" category, as of March 2nd, 2024

Publisher	#Journals	Fully OA	"Female"**	Hybrid	"Female"**
Elsevier*	8	2 (25%)	39.5%	6 (0.75%)	22.9%
JMIR Publications	4	4 (100%)	33.2%	0 (0%)	N/A
BioMed Central	3	3 (100%)	35.8%	0 (0%)	N/A
Oxford UP	2	1 (50%)	27.3%	1 (50%)	44.0%
Miscellaneous	11	3 (27.3%)	34.0%	8 (73.7%)	39.3%
Total	28	13 (46.4)		15 (53.6)	

* including Elsevier BV, Elsevier Ireland Ltd., Elsevier, and Elsevier Ltd.
**refers to the average of the percentages for "female" in the respective selected Journals

4. Discussion

A lack of diversity among editors is a recognized barrier to achieving aims to promote DEI in scholarly publishing [9,10]. Findings suggest that female EiCs and EB members are underrepresented, and US geographical affiliations are overrepresented among top medical informatics journals. This analysis showed that only 25% and 32.7% of EiC and EB members, respectively, are female, which is consistent with comparable 2021 data for medical journals [4]. Moreover, previous research suggests that EB members from traditionally ethnically non-White populations (Asia, Africa, and South America) are underrepresented, with a percentage of 19% [3]. This is also in line with our findings, with these three continents being represented by only 14.3% of the affiliated EB members. Publishers have already taken initiatives to explore the diversity in their EBs, in order to take action to balance the representation amongst editors [11,12]. This study has limitations. Tools like genderize.io offer promising results in past use cases [13-15],

however, training of the tool is potentially susceptible to biases and errors. Although direct confirmation of gender and geographic location from editors could offer reliable gender identification, other limitations of such data could arise (e.g., low response rates). Finally, this analysis was based only on the SJR for Q1 list of journals in the selected category; journals not listed in this category may have been omitted.

5. Conclusions

This paper identifies potential areas for improvement to diversify top-ranked medical informatics journals' editorial boards. Further investigation could examine gender and geographical affiliations of EBs for journals in all quartile rankings or other indices. Initiatives within informatics professional societies, scientific communities, and publishers to promote DEI in informatics journals could be valuable to advance the field.

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