



Diversity, Equity, and Inclusion on Editorial Boards of Global Health Journals

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Abstract

Journals have been described as “duty bearers” of upholding fundamental ethical principles that are essential for maintaining the ethical integrity of newly generated and disseminated knowledge. To play our part, we evaluated diversity and inclusion in the leadership and management of global and international health journals. We developed Journal Diversity Index (JDI) to measure three parameters of diversity and representation (gender, geographic, socioeconomic status). Relevant information regarding editorial board members of systematically screened journals was sequentially extracted and job titles were categorized into five editorial roles. Chi-squared test was utilized to study associations between gender and geographic distribution of editors along with the Medline indexing of the journal and its impact factor. Out of 43 journals included, 62.7% were published from two high-income countries. Women comprised 44% of the total editors. Among all the editorial board members, we did not find any information suggesting the representation of non-binary and transgender individuals. Furthermore, 68.2% of editors were based in high-income countries with 67.3% of the editors belonging to the Global North. This disparity in geographic region and socioeconomic level was observed across all five editorial roles. Among all women editors, more than 70% worked in non-Medline and non-impact factor journals. Only two journals scored “excellent” on JDI. Despite the continuous evolution of the definition of global health ethics, marginalized individuals, and their perspectives remain underrepresented in this field. Thus, we call for swift action regarding the decentralization and redistribution of global and international health journal editorial boards.

Keywords Publication ethics · Global health · Gender equity · Diversity · LMIC · Global South

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Introduction

Global health is more than just “*public health beyond borders.*” Global health ethics, a relatively newer term, conceptualizes the application of morally acceptable solutions to health issues requiring action at a global level. What was intended to be a vision of advocating for health equity is perpetually dominated by those in positions of historical power. Though health equity is one of the core values of global health ethics, it is seldom prioritized and highlighted. Thus, it is not uncommon to witness systemic inequities uncovered by phenomena demanding global action, such as the coronavirus 2019 (COVID-19) pandemic. A genuinely ethical frame of reference for global health should entail a culture that promotes equitable access to opportunities and care, celebrates individual differences as community strengths, and creates an environment of inclusion irrespective of race, geographic background, socioeconomic status, gender, or belief systems.

The “global” in global health appears to have been left unacknowledged, and ethics of inclusion may further be violated when homogeneity in cultural, social, and personal characteristics is perpetuated. Nationals from high-income countries (HICs) hold 75% of seats across 146 global health governing boards but only comprise 15% of the world population (Global Health 50/50 2022; The World Bank 2021). Individuals from the UK and the USA represent more than half of the 2014 board members, while low-income countries (LICs) are represented on only 50 seats. The difference represented by this distribution of “50 seats and 50% seats” is neither in conformity with the global population nor the global burden of disease. This is further reinforced by the fact that 73% of these global health organizations are headquartered in only three countries in the Global North (Global Health 50/50 2022).

Furthermore, ethical issues pertaining to limited gender diversity, in the context of global health, remain under-discussed. Still, movements such as #LancetWomen, Global Health 50/50 (GH5050), and Women in Global Health have shed light on the unequivocally essential issues pertaining to the ethics of inclusion and gender equity (Zeinali et al. 2019). Women are often underrepresented in leadership positions, despite forming 75% of health workers (Zeinali et al. 2019). Non-binary and transgender individuals are so neglected that statistics on their representation are sparsely available for these organizations. The gender gap in Economic Participation and Opportunity will take another 267 years to close, as per the Global Gender Gap Report 2021 (World Economic Forum 2021).

The Nuffield Council on Bioethics presents an ethical compass that lists three core values that guide researchers at the level of policy-making and on the ground (Wright 2020). These core values include equal respect, fairness, and helping reduce suffering. Among other actors, journals have been referred to as “duty bearers” of maintaining these values and ensuring that these principles are upheld during the process of decision-making (Wright 2020). Moreover, justice, one of the four main pillars of ethics, has been described as a critical guiding value for global health research. However, these values of fairness and justice are undermined when people most affected

by emergencies are least likely to have their voices heard (Wright 2020). Scarce distribution of research funds and resources in low and middle-income countries has further widened the equity gap in global health research and publication (Abimbola et al. 2017; Sheikh et al. 2017). This places global health at risk of being unbalanced in the dissemination of perspectives when individuals from the global north inadvertently influence decision-making in the research sector (Kumar et al. 2022).

What is the current state of ethics of diversity and representation in global health publications? We set to answer a part of this question pertaining to editorship under pre-set gender, regional, and socioeconomic parameters. The notion that global health research can contribute to reducing health disparities calls for a broader framework of ethical considerations in the conduction and evaluation of this research (Pratt and Hyder 2015).

Methodology

We conducted a cross-sectional analysis of global and international health journals to study diversity, equity, and inclusion (DEI) regarding gender, region, and socioeconomic status. However, we acknowledge that the definition of diversity entails numerous other domains which are beyond the scope of the factors discussed in this study.

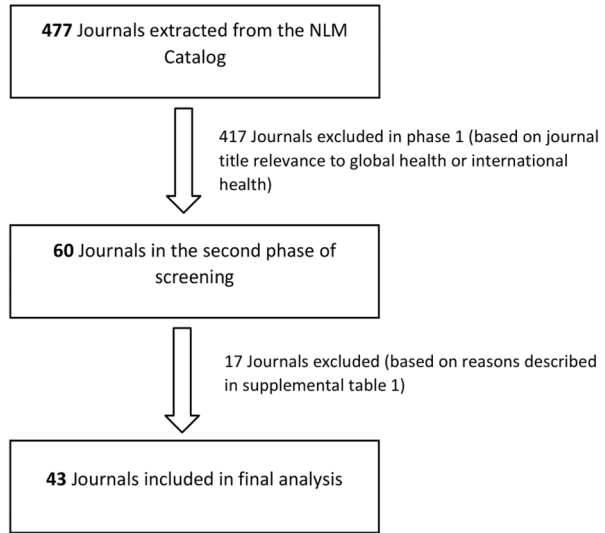
Journal Selection

Any journal committed to publishing global health or international health research was considered eligible for inclusion. Journals were extracted from the National Library of Medicine (NLM) catalog through a search strategy modified from one previously employed by Bhaumik and Jagnoor (2019).

(Global Health [MeSH Terms] OR (Internationality [MeSH Terms] AND Public Health [MeSH Terms]) OR International health [All Fields] OR Global health [All Fields]) AND ncbijournals.

Journals extracted were screened systematically in phases, as depicted by the flowchart in Fig. 1, for eligibility by two authors (MRM and IN). Any disagreements were resolved through discussion and consensus. During the first phase, journals were screened based on the relevance of their titles. Journals not relevant to global health and international health were subsequently excluded. The remaining journals were screened further in the second phase using an elaborate eligibility criteria. It was decided to exclude journals for the following reasons: (1) cessation of publication by the journal; (2) lack of editorial board (EB) information available online; (3) not a global health journal; (4) not a medical or scientific journal; (5) no records of the journal found. The complete list of 17 journals with their reasons for exclusion can be found in Supplemental Table 1.

Fig. 1 Flow chart demonstrating screening of journals for inclusion in two phases



Data Extraction

Journal websites were screened from April to May 2022 to collect information related to the editors and the characteristics of the journals. Data were collected by three authors (AQ, FZ, and AR) and were later cross-checked and agreed upon for consistency by MRM. All editors were included in the analysis except founding and honorary editors. Any disagreement in the inclusion of an editor was resolved through consensus among the data collectors.

Gender and country of affiliation of editors were recorded along with their editorial job position. The *gender* of each editor was determined using a systematic approach as previously described (Al-Busaidi et al. 2021). The journal websites were first screened for gender-related information such as pronouns and/or pictures of the editor. We acknowledge that inferring gender from pictures of the editors may not give an accurate representation of the gender with which they choose to identify. However, due to limited information available on specific journal websites, we proceeded with this approach as has been done in previous studies. In case gender could not be determined through pronouns and photographs, we resorted to using a validated web-based software, <https://genderize.io/>, to determine the gender of editors based on an analysis of their first names. Gender was recorded as “unknown” if these steps failed to yield a reliable result. The World Health Organization defines gender as “*characteristics of women, men, girls, and boys that are socially constructed. This includes norms, behaviors, and roles associated with being a woman, man, girl or boy, as well as relationships with each other*” (WHO n.d.) We opted to categorize gender using a binary approach. We recognize that recording gender under a binary model, instead of a spectrum, would appear to be an oversimplification—sending a notion of lack of inclusivity towards various gender identities. However, that is not the perspective we intend to convey. The binary characterization of gender in our study is indicative of nothing more than the restrictions of the publicly available data.

Table 1 Editorial roles: categorization of editorial job positions into five roles

Category	Roles included
Lead and chief editorial roles	Editor in chief Chief editor Editor (when clearly highlighted as chief) Co-editor (when clearly highlighted as chief) Field chief Specialty chief
Executive editorial roles	Deputy editor in chief Executive editor Managing editor Editorial assistant Associate editor (when only one) Deputy chief editor Assistant editor Co-editor in chief Deputy editor Editorial coordinator
Senior and section editorial roles	Associate senior editors Associate editors Scientific editor Specialized associate editor Guest associate editors Review editors Regional editor Senior editor Assistant managing editor Editor emeritus Statistical editor Academic editor Youth editorial board Section editor Book review editor Copyeditor

Table 1 (continued)

Category	Roles included
General and advisory editorial roles	Editorial board
	Advisory board
	Editorial advisory board member
	Editorial council
	Editorial advisor
	International editorial advisory board
	Global advisory board
	Board of editors
	Executive advisory committee
	Senior advisory board
	International editorial board
	Central Asian editorial board
	Nonacademic and administrative editorial roles
Communications editor	
Distribution editor	
Editorial office	
Editorial office staff	

A total of 49 editorial job positions were identified, which were divided into five categories comparable to a system described by Gallivan et al. (2021). However, the job positions were categorized in accordance with our data set, and roles were assigned within the context of each journal as illustrated in Table 1.

Furthermore, a sequential approach similar to the one used to determine gender was utilized to ascertain the country of affiliation of the editors. The journal website, recent publications of the editor, and any academic websites listing their institution were sequentially screened and the country of affiliation of the editor was determined. It was then classified into one of the seven World Bank geographic regions: North America, East Asia and Pacific, Middle East and North Africa, South Asia, Europe and Central Asia, Latin America and the Caribbean, and Sub-Saharan Africa. The country of affiliation was further classified into the following World Bank socio-economic groups: HIC, upper-middle-income country (UMIC), lower-middle-income country (LMIC), and LIC. Journal websites were further analyzed to gather key information related to the journal such as the name of the journal, country of publication, status of its Medline index, impact factor in the Journal Citation Report (JCR), and total editorial board members.

Journal Diversity Index

The Composite Editorial Board Diversity Score (CEBDS) (Bhaumik and Jagnoor 2019) is an important tool that provides a functional framework to measure diversity on journal editorial boards in terms of gender, World Bank geographic regions, and World Bank country income level groups. However, notable flaws and inconsistencies have been reported in the literature regarding the scoring of its three domains. CEBDS does not account for the journals having more than 60% women editorial board members, while those with even a single woman as a member can score moderately in the gender diversity domain. Similar conclusions can be made regarding the scores of regional and country income level diversities of CEBDS. The authors of this study unanimously agreed to differ from using CEBDS as a reliable measure of diversity. Therefore, in order to assign diversity scores, we developed the Journal Diversity Index (JDI). The JDI measures diversity in three parameters similar to those described initially in the CEBDS, i.e., gender of the editorial members, World Bank geographic region, and World Bank socioeconomic level of their country of affiliation. Unlike the CEBDS, which uses a percentage of woman members as a measure of gender diversity, JDI uses the difference in proportions of men and women editorial board members, which we refer to as the “*Pooling index of gender.*” Although the percentage of women is a reasonable measure of their “representation” on EBs, it fails to evaluate “diversity” which implies the presence of heterogeneity in characteristics (i.e., gender) and not greater representation of one specific group. Accordingly, a score claiming to measure overall diversity should not falsely measure the representation of one group, e.g., a greater percentage of editors of one specific gender. If we say there are 60% women editors on an EB, this would indicate good representation and maximum gender diversity score according to CEBDS, but poorer diversity when assessing comparatively against a journal having equal percentages of men and women editors.

Pooling index provides a measure to study the differences in proportions of two groups and ultimately gives information regarding the pooling of the characteristics of editorial board members towards one end. For example, if an editorial board has all editors who were identified as men, the pooling index would be 100, indicating a complete lack of diversity, and it would be zero in ideal circumstances if a journal had an equal proportion of men and women editorial board members. Pooling index additionally remains unaffected whether an editorial board is largely composed of men and women editors, and it would pool towards either gender if diversity is compromised. This is not a feature of the gender diversity domain of CEBDS. Additionally, using the one-sample binomial test, JDI considers the statistical significance of the deviation of this proportion from a hypothesized test proportion of 50%. CEBDS further does not account for the representation of women in lead/chief editorial job positions, which we attempted to rectify in the gender diversity score of JDI.

Similarly, the pooling index can be calculated for country income level by calculating the difference in the proportion of editorial members from higher-income countries (high income plus upper middle income) and lower-income countries

(lower middle income plus low income) and for geographic diversity by calculating the difference in proportion between editors from the Global North and those from the Global South. JDI amounts up to a maximum of 40 points, and journals are ranked upon calculating the percentage of their scores. Journals with a percentage JDI of less than 20% were considered to have very poor diversity, 21–40% as poor, 41–60% as moderate, 61–80% as good, and 81–100% as excellent. Table 2 explains the JDI components, and the scores assigned to each variable.

Statistical Analysis

Data was collected and coded on data collection sheets designed using Microsoft Excel and was analyzed with SPSS version 26. Data were summarized using descriptive statistics. One sample binomial test was performed to study differences in proportions of gender data of each journal as well as the entire data set. Chi-squared test was performed to examine associations between the gender of the editor and their geographic distribution, impact factor of the journal, and the status of its Medline indexing.

Results

Out of the 43 global and international health journals included, 37.2% ($n=16$) had an impact factor listed in the Journal Citation Report and 44.2% ($n=19$) were fully indexed in Medline. Additionally, 88.4% ($n=38$) of these journals were published from HICs, 4.7% ($n=2$) from UMICs, and 7% ($n=3$) from LMICs, while none were from LICs. These global and international health journals represented a total of 15 countries, with most of them being published from the USA ($n=14$), UK ($n=13$), Switzerland ($n=3$), and India ($n=2$). Canada, China, Croatia, Germany, Iran, Japan, Korea, Netherlands, Poland, the Kingdom of Saudi Arabia, and South Africa collectively represented 11 journals. Regional analysis revealed that 46.5% of the journals included ($n=20$) belonged to “Europe and Central Asia,” 34.9% ($n=15$) from “North America,” 7% ($n=3$) from “East Asia and Pacific,” 4.7% ($n=2$) from “Middle East and North Africa” and “South Asia” each, only 2.3% ($n=1$) from “Sub Saharan Africa,” and none from “Latin America and Caribbean.”

The median editorial board size was 34 with an interquartile range (IQR) of 29 (23–52), and the median proportion of women editorial members was 36.77% (IQR=20.50, 26.75–47.25). Percentage of women editors on these editorial boards ranged from 11.76 to 76.79%. Data for a total of 2294 editorial members was extracted and gender could not be determined for 33 (excluding them from gender analysis). Out of the remaining 2261, women represented only 44% ($n=995$) of the total editorial members ($p<0.001$). A total of 76.9% of these women editors were associated with journals without an impact factor and 73.2% with journals not indexed in Medline. Out of the 995 women editors, 32.8% were from “North America” while only 2% were from “Middle East and North Africa.” Country income level analysis revealed that 71.1% of the women editors were from HICs and only

Table 2 Scoring system to calculate journal diversity index (JDI)

Variable	Score assigned
Gender diversity	
Pooling index of gender	
Difference in gender proportions between men and women editorial members	
	90–100%
	80–89%
	70–79%
	60–69%
	50–59%
	40–49%
	30–39%
	20–29%
	10–19%
	0–9%
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
Woman editor in chief/lead editorial job position	
	No
	Yes
	0
	1
	1
	0
	Yes
	0
Geographic diversity	
Pooling index of geographic regions	
Difference in proportions of editorial members from Global North and Global South	
	90–100%
	80–89%
	70–79%
	60–69%
	50–59%
	40–49%
	30–39%
	20–29%
	10–19%
	0–9%
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9

Table 2 (continued)

Journal Diversity Index (JDI)	Variable	Score assigned
At least one editor based in all seven of the above-mentioned World Bank geographic regions would yield the maximum score of 7 (1 for each individual group)	North America	+1
	Europe and Central Asia	+1
	East Asia and the Pacific	+1
	Middle East and North Africa	+1
	Latin America and the Caribbean	+1
	South Asia	+1
	Sub-Saharan Africa	+1
	90–100%	0
	80–89%	1
70–79%	2	
Socioeconomic diversity	60–69%	3
	50–59%	4
	40–49%	5
	30–39%	6
	20–29%	7
	10–19%	8
	0–9%	9
	High-income countries	+1
	Upper middle-income countries	+1
At least one editor based in all four of the above-mentioned World Bank socioeconomic regions would yield the maximum score of 4 (1 for each individual group)	Low middle-income countries	+1
	Low-income countries	+1
	Scoring	+1

Table 2 (continued)

Journal Diversity Index (JDI)	
Variable	Score assigned
Minimum score = 2	0–20
Maximum score = 40	21–40
	41–60
	61–80
	81–100
	Very poor
	Poor
	Moderate
	Good
	Excellent

JDI = Gender diversity + Geographic diversity + Socioeconomic diversity

Total attainable score in each category of gender, geographic distribution, and socioeconomic level is 11, 16, and 13, respectively

2.3% from LICs. Country-wise distribution of editors has been depicted using a choropleth map in Fig. 2.

The most significant difference between the proportions of men and women editors was found in the “Middle East and North Africa” with only 36.4% of the editors from this region being women. Among the editors from “Europe and Central Asia,” women represented 46.2% of the total editors and hence, it was found to be the region with the least difference between gender proportions. Interestingly, among the editors from LICs, the percentages of men and women editors were almost equal, i.e., 51.1% and 48.9%, respectively, as illustrated in Fig. 3.

We determined the country of affiliation for all of the editors, revealing that 106 countries were represented across a data set of 2294 editorial members. A total of 27% of the editorial members ($n=620$) were from the USA, 11.4% ($n=261$) from the UK, 5.7% ($n=130$) from India, 4.8% ($n=109$) from China, and 4.5% ($n=104$) from Canada. Further analysis using regional data revealed that 31.6% of the editorial members ($n=725$) were affiliated with institutions in the World Bank region of “North America” and 27.6% ($n=632$) of “Europe and Central Asia.” Editorial members from the institutions in “Middle East and North Africa” were least represented with only 2.9% ($n=67$) of the total, followed by 5% ($n=114$) from “Latin America and the Caribbean.” Overall, 67.3% of the editors ($n=1543$) were from the countries in the Global North.

Out of the total 2294 editorial members, 68.2% ($n=1563$) were affiliated with HICs, 14.2% ($n=326$) with UMICs, 15.5% ($n=355$) with LMICs, 2.1% ($n=47$) with LICs, and 0.1% ($n=3$) with institutions from Venezuela which is not classified in any of the world bank income groups and was therefore excluded from further regional analysis.

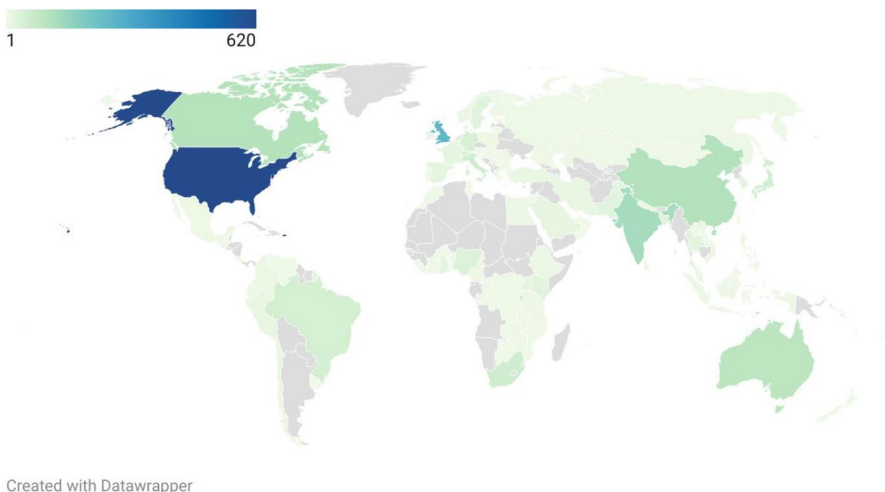


Fig. 2 Choropleth map demonstrating global distribution according to the number of editors in each country



Fig. 3 Difference in proportion between men and women editors. **A** Among all four country income levels. **B** Among all seven World Bank Regions

Comparison between global distribution and gender of the editors revealed that only 29.4% of the women, and 35.2% of the men editors were from the Global South. Among the editors from the Global North, 53.9% were men, while among those from the Global South, men constituted 60.4%, indicating a more significant disparity between the proportions of men and women editors from the Global South

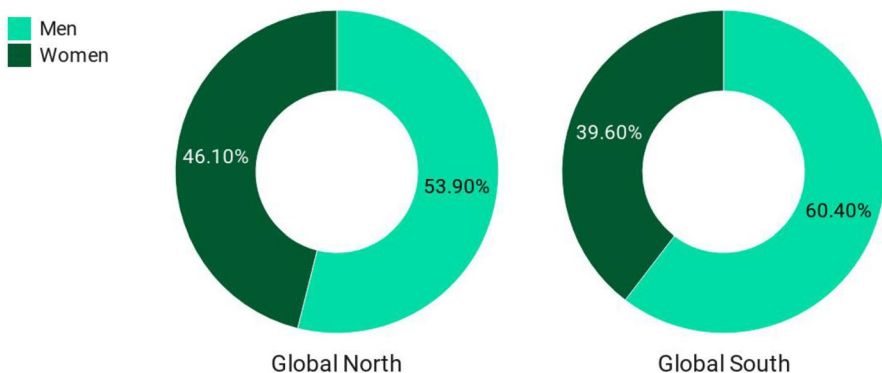
($p < 0.05$). This gender distribution between Global North and Global South has been demonstrated in Fig. 4.

A total of 49 editorial positions were identified, divided into five roles as previously discussed. Out of the 2294 editorial members, 57.4% ($n = 1316$) were classified as working in “General and Advisory editorial roles,” 2.9% ($n = 66$) in “Lead/Chief editorial roles,” 2.6% ($n = 60$) in “Executive editorial roles,” 0.4% ($n = 9$) in “Nonacademic and Administrative roles,” and 36.7% ($n = 843$) were working under “Senior and Section” editorial roles. Main results relating to the gender, regional, and country income level analysis of editors within these editorial roles have been summarized in Supplemental Table 2 and depicted graphically in Figs. 5 and 6.

Among the 1656 editors working in non-impact factor journals, 46.2% were women, while among the 605 editors working in impact factor journals, only 38% were women ($p < 0.05$). Additionally, among the 1575 editors working in non-Medline indexed journals, 46.2% were women. Conversely, out of the 686 editors working in Medline-indexed journals, only 38.9% were women ($p < 0.05$).

Analysis of the journal data revealed 34 editorial boards having greater than 50% men editors, and only two journals (Global Reproductive Health (GRH), and Global Journal of Health Science (GJHS)) demonstrating equality in terms of gender representation. However, these journals had a small editorial board size of six and four editors in total for GJHS and GRH, respectively. Additionally, 25 editorial boards did not have even a single woman as an editor in Lead/Chief roles.

Using the JDI, the median gender diversity score was calculated as 8 (IQR = 5–10), median socioeconomic diversity scores as 5 (IQR = 3.5–7), and median geographic diversity score as 10 (IQR = 7.5–13). As shown in Table 3, only two journals (Global Journal of Health Science and Global Advances in Health and Medicine) scored the maximum gender diversity score of 11. None of the journals scored the maximum socioeconomic diversity scores while only one journal (PLOS Global Health) scored the maximum geographic diversity score. None of



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Fig. 4 Overall gender distribution between Global North and Global South

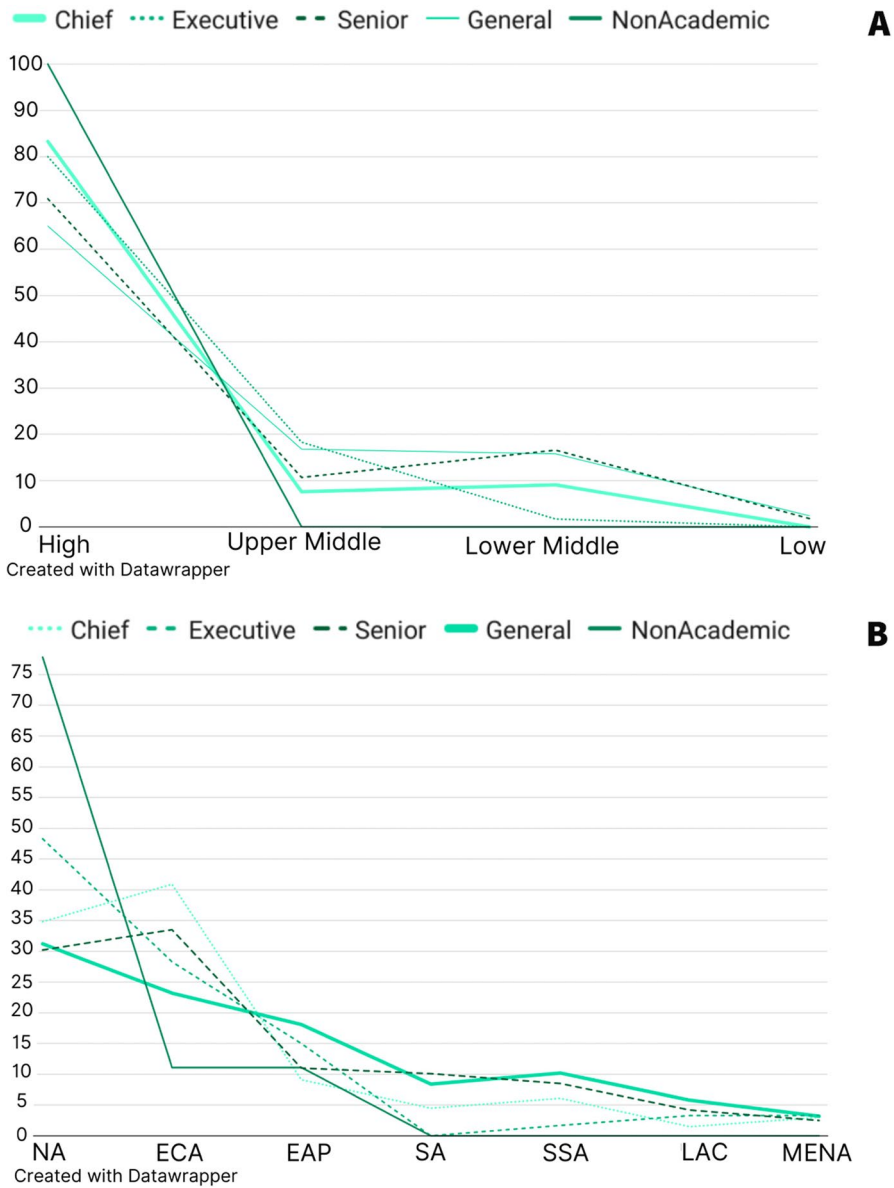


Fig. 5 **A** World Bank country income level trend across all five editorial roles. **B** Percentage of editors across all five editorial roles affiliated with the World Bank Geographic Regions. NA, North America; ECA, Europe and Central Asia; EAP, East Asia Pacific; SA, South Asia; SSA, Sub-Saharan Africa; LAC, Latin America and the Caribbean; MENA, Middle East and North Africa

the journals scored the maximum JDI but two journals (PLOS Global Health and Global Mental Health) showed excellent diversity when evaluating the percent JDIs. In total, 14 journals demonstrated good diversity, 19 showed moderate diversity, and six had poor diversity when assessed using the percent JDI.

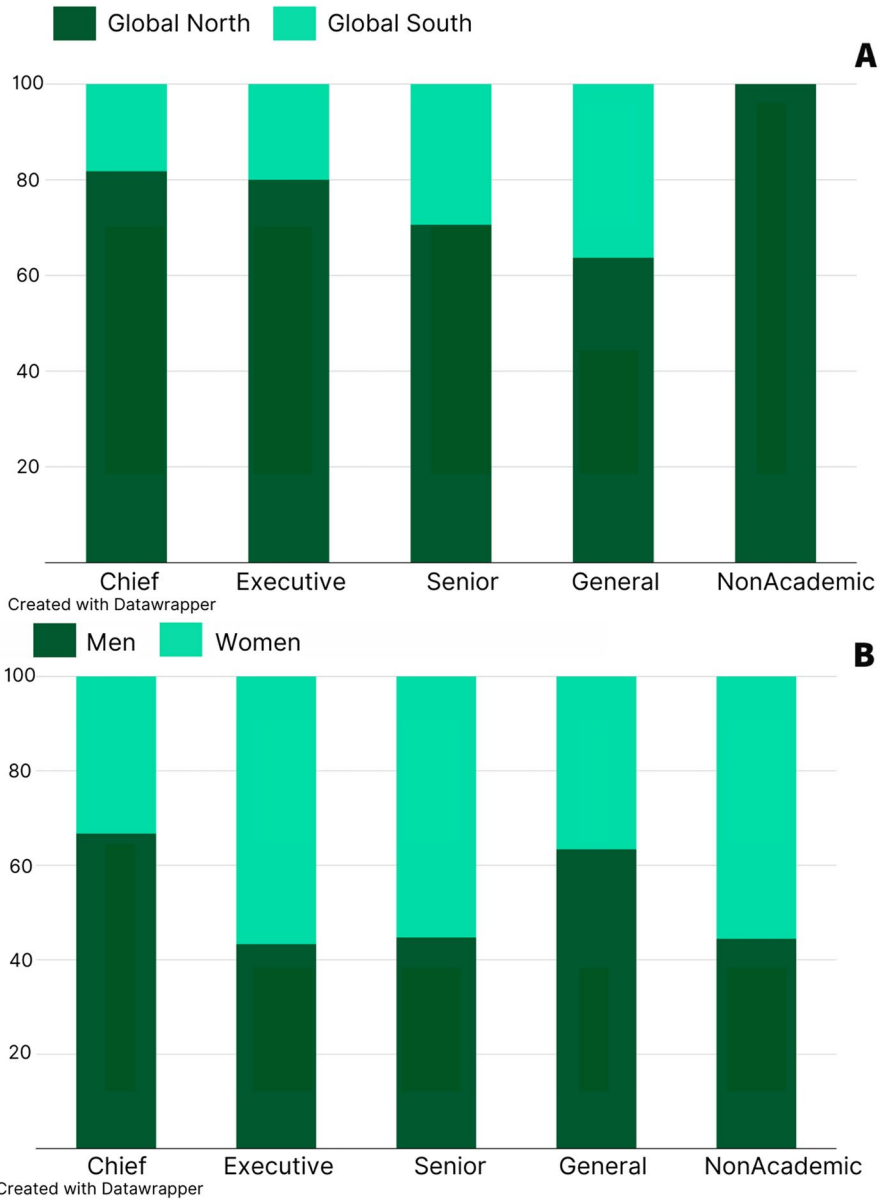


Fig. 6 **A** Global distribution of editors across all five editorial roles. **B** Overall gender disparity across all five editorial roles

Discussion

The analysis of EBs of 43 global and international health journals performed as of June 2022 reinforces the observation that principles of ethics may be violated

Table 3 Breakdown of Journal Diversity Indices of 41 Global and International Health Journals

Journal Name	Gender Diversity			Geographic Diversity			Socioeconomic Diversity			JDI	JDI (%age)
	Pooling Index of Gender	Woman editor in Chief/Lead Roles	One Sample Binomial Test	+1 For At Least One Editor From One of the Seven World Bank Geographic Regions	Pooling Index of Geographic Regions	Pooling Index of Country Income	+1 For At Least One Editor From One of the Four World Bank Country Income Levels				
Annals of Global Health	5	0	0	7	3	1	3	19	47.5		
BMJ Global Health	7	0	1	6	6	5	4	29	72.5		
Central Asian Journal of Global Health	4	1	0	3	4	0	2	14	35		
Clinical Epidemiology and Global Health	6	1	0	5	3	3	2	20	50		
Frontiers in Global Women's Health	4	1	0	7	5	3	4	24	60		
Global Advances in Health and Medicine	9	1	1	4	1	0	2	18	45		
Global Challenges	3	1	0	7	3	0	3	17	42.5		
Global Health Action	7	1	1	4	2	2	3	20	50		
Global Health and Medicine	3	0	0	4	1	0	3	11	27.5		
Global Health Governance	7	0	1	3	0	0	1	12	30		
Global Health Innovation	7	0	1	5	9	6	4	32	80		
Global Health Journal	6	0	0	3	8	0	2	19	47.5		
Global Health Promotion	7	1	1	6	5	1	3	24	60		
Global Health Research and Policy	9	0	1	6	7	1	4	28	70		

Table 3 (continued)

Journal Name	Gender Diversity			Geographic Diversity		Socioeconomic Diversity			JDI	JDI (%age)
	Pooling Index of Gender	Woman editor in Chief/Lead Roles	One Sample Binomial Test	+1 For At Least One Editor From One of the Seven World Bank Geographic Regions	Pooling Index of Geographic Regions	Pooling Index of Country Income	+1 For At Least One Editor From One of the Four World Bank Country Income Levels			
Global Health Science and Practice	9	0	1	5	4	4	3	26	65	
Global Health Epidemiology and Genomics	7	0	1	5	9	2	4	28	70	
Global Journal of Health Science	9	1	1	3	3	3	2	22	55	
Global Mental Health	9	0	1	6	9	6	4	35	87.5	
Global Pediatric Health	5	0	0	6	1	1	2	15	37.5	
Global Psychiatry	6	0	1	5	5	3	3	23	57.5	
Global Public Health	9	0	1	6	8	2	3	29	72.5	
Global Reproductive Health	9	0	1	2	0	0	1	13	32.5	
Global Social Welfare, Research Policy And Practice	6	1	1	6	2	0	2	18	45	
Globalization and Health	9	0	1	7	3	1	3	24	60	
International Health	5	1	0	4	4	1	4	19	47.5	
International Journal of Maternal and Child Health(MCH) and AIDS	5	0	0	6	7	5	4	27	67.5	

Table 3 (continued)

Journal Name	Gender Diversity			Geographic Diversity		Socioeconomic Diversity			JDI	JDI (%age)
	Pooling Index of Gender	Woman editor in Chief/Lead Roles	One Sample Binomial Test	+1 For At Least One Editor From One of the Seven World Bank Geographic Regions	Pooling Index of Geographic Regions	Pooling Index of Country Income	+1 For At Least One Editor From One of the Four World Bank Country Income Levels			
International Journal of Public Health	8	1	1	6	2	1	4	23	57.5	
International Journal of Travel Medicine and Global Health	2	0	0	6	9	2	3	22	55	
International Public Health	3	0	0	5	1	1	2	12	30	
Journal of Global Health Economics and Policy	8	0	1	4	7	6	4	30	75	
Journal of Global Health Reports	6	1	1	5	5	4	3	25	62.5	
Journal of Global Health Science	7	1	1	5	2	2	3	21	52.5	
Journal of Global Health	7	1	0	6	5	2	3	24	60	
Journal of Global Infectious Disease	4	1	0	7	8	3	4	27	67.5	
Journal of Global Radiology	9	0	1	7	5	2	3	27	67.5	
Pathogens and Global Health	4	0	0	6	4	1	3	18	45	
Pediatrics and International Child Health	2	0	0	6	9	4	4	25	62.5	
Plos Global Health	8	1	0	7	9	6	4	35	87.5	

Table 3 (continued)

Journal Name	Gender Diversity		Geographic Diversity		Socioeconomic Diversity		JDI	JDI (%age)	
	Pooling Index of Gender	Woman editor in Chief/Lead Roles	One Sample Binomial Test	+1 For At Least One Editor From One of the Seven World Bank Geographic Regions	Pooling Index of Geographic Regions	Pooling Index of Country Income			+1 For At Least One Editor From One of the Four World Bank Country Income Levels
Lancet Global Health	8	1	1	7	7	3	4	31	77.5
Lancet Planetary Health	9	0	1	6	4	2	3	25	62.5
Tropical Medicine and International Health	3	1	0	6	4	2	4	20	50

when diversity across all three parameters (gender, geographic, and socioeconomic) is compromised. This disparity became relatively more pronounced in positions of leadership. In addition to this, we present a comparison of our findings with diversity analysis of journals from other healthcare specialties. Limited regional diversity is also observed in EBs of medical education journals (Yip and Rashid 2021) and in a pooled cross-sectional analysis of anesthesia journals (Bould et al. 2022). Regarding country income level diversity, similar socioeconomic disparity is seen in EBs of four leading spine journals (Xu et al. 2019). Similarly, analyses of gender distribution in EBs of hematology (Liblik et al. 2022), psychiatry (Hafeez et al. 2019), surgery (Ehrlich et al. 2021), and neurology journals (Mariotto et al. 2020) present similar findings. This disparity across all three parameters in various disciplines demands prompt action. Therefore, it becomes imperative to address homogeneity on EBs, as when a powerful center, based mainly on men belonging to the Global North, takes charge of building a global and/or international health narrative, principles of global bioethics are subverted.

Global Health becomes More Important in a Post-Pandemic World

Particularly during global health emergencies, ethical challenges pertaining to global health research become more conspicuous (Wright 2020). The COVID-19 pandemic serves as a recent example of how ethical principles are undermined and health equity among nations is compromised. The global nature of this phenomenon argues that the pandemic cannot be approached from an individual perspective and that a broader framework of ethical considerations is needed to adhere to the principles of autonomy, beneficence, non-maleficence, and justice (ten Have 2022).

An important aspect to highlight here is the lack of globally coordinated efforts among countries responding to COVID-19 (Macklin 2022). This lack of coordination was highlighted when countries “blamed” each other for spreading the virus, which led to an outbreak of racism and prejudice against specific communities. History presents enough evidence of how marginalized communities have been used as scapegoats to divert attention from discussing the root cause of the crisis (Coates 2020). This was also observed when the coronavirus disease was labeled as the “Wuhan Virus, or the Chinese Virus” in mainstream media, aggravating discrimination and stigma around certain races (Rovetta and Bhagavathula 2020).

Moreover, with the development of vaccines for COVID-19, questions of vaccine prioritization assume primary importance, since answers to these questions are purely ethical and not scientific (Giubilini et al. 2021). The ethical nature of these questions becomes more evident when deciding whether to use the initial doses of vaccine to vaccinate as many individuals as we can or to prefer saving certain kinds of lives over the others (Giubilini et al. 2021). As vaccine production and distribution was mainly directed by and towards rich nations, there were disparities in distribution of doses among countries and within countries (Chaudhuri et al. 2021).

Although the composition of EBs of global and international health journals has been examined before COVID-19 (Bhaumik and Jagnoor 2019; Nafade et al. 2019), this is the first study that explores gender, geographic and socioeconomic diversity

in EBs in a post-pandemic period as we believe that COVID-19 presents an excellent opportunity to explore ethical dilemmas simultaneously and the role global and international health journals can play in upholding these principles of ethics.

Is Knowledge Really being Generated? If so, Who are the Producers and Who are the Consumers?

As bioethicists argue, global health research is responsible for generating new knowledge regarding health problems, typically but not exclusively encountered by low and middle-income countries, and encouraging the participation of these groups in decision-making processes (Pratt 2021). Global and international health journals, thus, play a gatekeeping role in generating and disseminating this new knowledge. When EBs of these journals are dominated by individuals belonging to the Global North, perspectives and views then generated may acquire a “western” outlook. A difference in priorities of health problems may exist between the Global North and the Global South. Thus, journals with editors based in developed regions may focus largely on healthcare issues of one side of the world. An important consequence of which is that research topics from developing countries may be deemed “uninteresting” or “irrelevant” for a journal readership allowing a bias against “diseases of poverty” to perpetuate (Horton 2003; Langer et al. 2004). Thus, valuable intellectual capital is lost that could have contributed significantly to devising new approaches and enhancing innovation.

Although several explanations have been presented that account for poor representation of low and lower-middle-income countries on decision-making panels, it is neither conscionable nor accurate to describe a lack of capable scientists or inadequate expertise in the Global South as an excuse for this disparity (Espin et al. 2017). IJsselmuiden et al. (2010) describe “respect for Southern innovation” as one of the three values required to evolve ethical considerations in global health research. This respect is lost when knowledge held by individuals belonging to low- and middle-income groups is inadequately appreciated and consequently overlooked during decision-making (Hellowell and Schwerdtle 2022). It bears serious implications as marginalizing Southern knowledge can greatly reduce the effectiveness of a discipline (Svadzian et al. 2020).

Nothing About Us, Without Us: Why Lower-Middle and Low-Income Countries Deserve a Seat at the Table of Decision-Making

Although most of the world’s disease burden falls on low and middle-income countries, (GBD 2019; Demographics Collaborators 2020) a lack in contribution to original research and representation of editors belonging to these regions is reported (Melhem et al. 2022). Only 15% of the world’s population resides in HICs, yet they heavily dominate discussions pertaining to global health (Sheikh et al. 2017). The viewpoints of a few individuals occupying higher echelons cannot and should not represent the perspectives of individuals belonging to other regions of the world.

Otherwise, there is a risk of exacerbating North American (Yip and Rashid 2021) and European bias, allowing views from such high-income groups to dominate.

An example of how lack of inclusivity in pivotal positions affects decision-making is given by the “copy-pasting” of strategies from developed countries during COVID-19, and the implementation of these protocols in the developing countries (Büyüm et al. 2020). Though effective, lockdowns and social distancing measures do not seem to work well in cramped-up slum complexes (Büyüm et al. 2020). Thus, when a poorly inclusive leadership decides for all, health needs of the marginalized get overlooked. It must be realized that individuals closer to the problem have a better understanding of the existing problems and the context in which they exist, and hence are better equipped to provide solutions. This calls for decolonizing global health for which a good place to start are the places of academic publishing.

Nothing About Us, Without Us: Why Women Deserve a Seat at the Table of Decision-Making

As indicated by our analysis, fewer women are seen holding the title of editor in chief in global and international health journals. The general and advisory roles category was also noted to be dominated majorly by men. This is further reinforced by our finding that 25 editorial boards did not have even a single woman as an editor in Lead/Chief roles.

An important aspect to highlight here is that although many institutions and organizations claim to follow principles of ethics, discrimination against a particular gender and other minority groups persists at various levels of the hierarchy. An evidence of this discrimination is given by the phenomenon of “homophily” (Helmer et al. 2017). Gender of editors in higher positions may influence the recruitment of new editors and/or the promotion of junior editors to senior positions (IJsselmuiden et al. 2010). The role of senior editorial board members becomes especially important as the power to select future editorial board and to restructure the current one lies with them (Svadzian et al. 2020; Moriguchi 2022).

In the context of this discussion, we would also like to highlight how an applicant’s “selection process” largely depends on the beliefs and principles, referred to as ethics, of both the interviewer and the interviewee and also upon how the values of both parties eventually line up. Often in the hiring process violation of ethics may be observed owing to implicit biases, which stem from a complex interplay of beliefs, cultural expectations, and standardized associations made in accordance with social norms that influence behaviors in an unconscious manner (Phillips et al. 2016). Hence, these biases may intervene with the selection of future journal editors, allowing a lack of diversity and inclusivity to continue over time (Memon et al. 2022).

Unethical decisions may contribute to an unhealthy workspace by creating problems in leadership roles stemming from discriminatory practices (Craft 2013) which can result in unjust treatment of not only those currently employed but also of the potential employees. The recruitment and promotion of women, thus, becomes subject to the values and beliefs held by men occupying leadership positions. An

important consequence is that when fewer women hold chief roles, it leads to a decrease in women role models and mentors, which plays a significant role in inspiring women to strive for higher academic ranks (Hafeez et al. 2019; Faucett et al. 2017). Sufficient evidence implies that women occupying senior positions can make organizations more welcoming as well as more accessible to young researchers, thus facilitating their career progression (Potvin et al. 2018). A lack of admirable mentors can negatively influence a young editorial board member's choices, allowing disparity in gender representation to deepen (Weigel et al. 2020). Thus, it becomes imperative to acknowledge the existence of such biases and make efforts to reduce their influence in the selection and promotion of EB members.

Journal editorial boards hold substantial control over published content (Palser et al. 2022) and thus play an important role in generating new knowledge and disseminating new findings. It is important to realize that men and women hold different opinions and values which may influence their research interests (Fox et al. 2019); this allows diverse topics to be discussed that would otherwise remain unaddressed. Thus, journal leadership, inclusive of both genders, offers better insight and enhanced productivity in contrast to a homogenous EB (Swartz et al. 2019).

Out of the total women editors included in our analysis, most of them belonged to HICs and were based largely in North America. Underrepresentation of women particularly those affiliated with institutions in low and middle-income countries may lead to an imbalance in perspective. It is only ethically appropriate that as these women hold a better understanding of challenges encountered by other women belonging to LICs and LMICs, they can offer a better insight and provide more effective solutions to these problems. Thus, when we call for gender diversity on EBs, we stress specifically on the representation of women editors belonging to inadequately represented regions, including the Middle East and North Africa, Sub-Saharan Africa, and Latin America and the Caribbean. An EB can only be called diverse and inclusive if it harbors representation of all genders from all parts of the world.

In our study, we also report that among all editors who were identified as women, greater than 70% work in non-Medline and non-impact factors journals. From this observation, we infer that fewer women are seen working in journals with high impact and prestige. This absence of women editors from high-impact factor journals becomes necessary to address as these journals hold greater power in influencing global health research.

Thus, a lack of women in decisive positions can sideline them from participating in decision-making processes resulting in policies, and programs that are poorly reflective of their views and needs (Rouan et al. 2021). These statistics call for strict measures, firm policies, and systemic reforms to address gender inequity at all levels, as only then will we be able to achieve an ethically sound global health system.

Global and International Health Journals still have a Long Way to Go

A comparison of our analysis with previous studies conducted among global health journals (Bhaumik and Jagnoor 2019; Nafade et al. 2019) demonstrates a slight improvement (from 35% (Nafade et al. 2019) and 40% (Bhaumik and Jagnoor 2019)

to 43.9% in our analysis) in terms of representation of women on the EBs. However, this improvement may be attributed to a larger number of editorial members ($n=2294$) included in our study. Thus, our results indicate that over three years no significant improvement has been made in the gross representation of women editors and the inclusion of editors from low- and middle-income countries. The four principles of mainstream ethics assume primary importance especially when transition from policy to practice is weak and the “know-do gap” is wide. This failure in implementing these ethical principles may be informative of deeper roots of injustice.

It is pertinent to mention that inconsistencies demonstrated in the methodology adopted for scoring and ranking journals may account for the varied diversity status of the same journal observed in these two studies. For example, *Lancet Global Health* has CEBDS of 0 in the study of Bhaumik and Jagnoor (2019). However, it ranks second according to Nafade et al. (2019). These discrepancies have been addressed in JDI, according to which the journal shows good diversity.

Another difference between these studies that may influence diversity score is that while Bhaumik and Jagnoor (2019) consider regional diversity an important component of CEBDS, the methodology employed by Nafade et al. (2019) does not take into account regional distribution of editors in ranking the included journals. It is also interesting to note that in the analysis of Nafade et al. (2019), 33% of editors were based in low and middle-income countries but in our analysis, we observe a rather small percentage of 17.7% of editors based in these groups. From this observation, we infer that as we increase the number of global and international health journals, a lack of diversity at regional and country income levels becomes more pronounced. Our finding further reinforces this as we observe that only two journals managed to achieve “excellent” JDI score.

Recommendations

To uphold ethical principles and foster diversity and inclusivity in the EBs of global and international health journals as well as journals of other specialties, we propose “The 6R Approach” built on previously published literature as:

(i) Step 1: Recognize

Enhancing diversity on EBs of journals should begin with recognizing that diversity is paramount to enhancing innovation and driving excellence (Manan et al. 2022). In addition to this, it is essential to review the current composition of the EB and to recognize gaps in existing policies, and current practices to determine the extent to which these programs reflect the goals of diversity, equity, and inclusion (DEI). Gaining a deeper understanding of the barriers faced by individuals belonging to LICs is imperative to devising effective strategies (Williams et al. 2022). As suggested by Madzima and MacIntosh (2021), in order to enhance diversity, the needs of marginalized groups should not be “assumed” rather “recognized” by anonymous, third-party surveys, interviews, meetings, and discussions with the target member groups.

(ii) Step 2: Redefine

To formulate actionable policies, the first step that can be taken in this regard is to precisely define the terms “*diversity, equity, and inclusion*” (Williams et al. 2022). Though closely related, these concepts become discrete when explicitly defined which then helps to ensure that similar understanding is shared among all parties (Williams et al. 2022; Dewidar et al. 2022). Based on set of requirements issued by the Royal Society of Chemistry, Dewidar et al. (2022) suggest one of the six approaches employed to improving diversity in academia is the adoption of a carefully curated DEI statement by journals. Moreover, when this DEI statement is made a fundamental part of the mission and vision statements of a journal, a diverse pool of editors, authors, and reviewers is attracted (Madzima and MacIntosh 2021). It is at this step we suggest formulating long-term and short-term goals, keeping in view the needs of underrepresented groups and DEI statement issued by the journal. Hinton et al. (2022) present a socioecological framework for defining DEI goals. These long-term and short-term goals will allow sustainable solutions and ensure lasting impact (Lingras et al. 2021).

(iii) Step 3: Reform

As suggested by our findings, it is at the topmost level of the hierarchy that disparity in gender, geographic, and socioeconomic levels becomes more evident. Thus, the inclusion of underrepresented groups in chief roles should be made a priority. In this regard, a framework highlighting six focus areas—achievement, recruitment, environment, leadership development, innovation and outreach, and sustainability—for creating a more equitable and inclusive environment can serve as a model (Newman et al. 2019). Additionally, the CARE approach suggested by Williams et al. (2022) provides institutions with the tool to challenge the status quo and advance DEI. At the recruitment level, journals can increase the diversity of their reviewer pool by posting open calls for reviewer positions rather than relying on personal connections (Dewidar et al. 2022). Moreover, transparent criteria for selection, appointment, and promotion should be upheld. This can be achieved through regular institutional announcements and programs aimed at promoting inclusivity (Williams et al. 2022). Additionally, it is crucial to acquire resources to help facilitate the recruitment and subsequently the promotion of underrepresented groups (Williams et al. 2022). Editorial board members from diverse backgrounds may require additional support and training to effectively contribute to the journal. Providing opportunities for professional development and training can help to create a more inclusive and equitable environment. Thus, mentorship programs in which senior members collaborate with junior members and provide mentorship tailored to their specific needs should be encouraged and supported (Dewidar et al. 2022). Finally, promoting the use of inclusive language can help create an inclusive environment (Dewidar et al. 2022).

(iv) Step 4: Review

Forming review committees to monitor the extent to which the practices outlined above are followed is imperative to keep record of the progress. In order to effectively

evaluate the efficacy of these steps, it is important to devise metrics that can measure the success rates of interventions and attrition rates of marginalized groups. These metrics may include keeping a check on the number of individuals belonging to LICs and LMICs interviewed, hired, and promoted (Williams et al. 2022).

(v) Step 5: Rectify

Reviewing the impact of interventions will allow journals to redirect, renew, and if needed rectify ongoing efforts.

(vi) Step 6: Re-educate

The final step in our approach includes inculcating values of inclusivity and essential skills such as identifying bias and mitigating microaggressions early on in career so these are reflected later on in practice (Williams et al. 2022).

Limitations

The cross-sectional design of our study limited us from assessing longitudinal trends. As the composition of EBs is continually changing, our analysis only serves as a snapshot in time. It can, however, be used to monitor and improve the diversity score of a journal. Moreover, as we relied on journal websites for information, it is possible that some of the data that we retrieved were not up to date. Although our study has its limitations, it includes the highest number of editorial board members, which allows us to present a wider picture of diversity on these EBs through JDI which serves as a more effective measure of both “diversity” and “representation”.

Conclusion

Although in semantics, global bioethics put great emphasis on transcending geographical barriers and embracing individuals of all gender identities, races, and socio-economic backgrounds, these explanations are, however, met with great inaction in practice as many aspects of global health continue to be ruled by colonial perspectives. Today more than ever, we need not another definition of global health but recognition of this deep-rooted colonialism that continues to leverage certain groups over others. An excellent place to start can be centers of generating and disseminating knowledge, i.e., global and/or international health journals where decentralization and redistribution of epistemic authorities becomes a mandatory step.

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Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflict of Interest The authors declare no competing interests.

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