

INVITED PERSPECTIVE

Promoting diversity and overcoming publication barriers in Latin American neuroscience and Alzheimer's disease research: A call to action

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Abstract

Alzheimer's disease (AD) is a global health issue. Because AD is a condition demanding effective management, its socioeconomic burden is immense and threatens the health systems of both low- and middle-income (LMIC) and high-income (HIC) countries. However, while most of the HICs are increasing their budget for AD research, the situation is different in LMICs, and resources are scarce. In addition, LMIC researchers face significant barriers to publishing in international peer reviewed journals, including funding constraints; language barriers; and in many cases, high article processing charges. In this perspective, we discuss these disparities and propose some actions that could help promote diversity, and ultimately translate into improved AD research capacity in LMICs, especially in Latin American and Caribbean countries.

KEYWORDS

Alzheimer's disease, article processing charges, funding disparities, publishing barriers

HIGHLIGHTS

- Researchers in low- and middle-income countries (LMIC) face increasing difficulties such as financial constraints, language barriers, and article processing charges.
- Publication fees, in particular, can be a significant barrier in the process of publication and equal access to scientific information.
- Publication fee equalization initiatives by publishing companies could reduce the scientific inequality that disadvantages researchers in LMICs.

1 | INTRODUCTION

Establishing strong dementia research communities is a trailblazing approach to accelerate discovery and improve outreach, as the lack of public awareness on dementia may contribute to underdiagnosis and increased prevalence. For example, previous research estimated a dementia underdiagnosis of $\approx 77\%$ of cases in Brazil.¹ One can envision

the significant social, economic, and public health burden generated by these numbers. Additionally, the impact of dementia on Latin American and Caribbean (LAC) countries is among the highest in the world, and barriers to the diagnosis and characterization for dementia subtypes differ across countries.²⁻⁴

The scientific activity of a given country is generally related to its national income. This contributes to a challenging landscape for

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research in low- and middle-income countries (LMICs).⁵ While it is important to mention that most LMICs present internal emergencies (i.e., tropical and infectious diseases, poverty, famine, etc.) that need to be immediately addressed, the disparities that scarce financial resources cause in LMICs compared to high-income countries (HICs)⁶ are evident in the Alzheimer's disease (AD) field. Although AD scientists from LMICs are enthusiastic to develop high-quality research, they face multiple obstacles that are barely visible to the broader AD community, such as access to funding opportunities and English proficiency.⁷

In this complex scenario, access to funding not only represents a barrier to obtaining reagents, salaries for key personnel, and equipment, but also to the increasing costs of open access publishing fees, which are now increasingly in place in many scientific journals. These fees are prohibitive to most LMIC researchers. For example, the most significant nationwide grant for young independent investigators in Brazil, the "CNPq-Universal," is limited to 30,000 Brazilian reais (BRL), equivalent to ≈5500 US dollars (USD) for 3 years. Conversely, the open access (OA) publishing charges of *Alzheimer's & Dementia: Translational Research and Clinical Interventions* is 2200 USD, almost 50% of a "CNPq-Universal" basic grant. The situation in Chile is similar: the annual national budget of young-senior scientists is ≈40,000 Chilean pesos (CHP), used for paying for reagents, equipment, salaries, and publications fees. Hence, the OA problem to LMIC investigators is real and must be addressed to promote diversity in the AD research field.

In addition, language barriers, mostly related to English as a second language, are also problematic and must be considered. A study carried out with biological science researchers in Colombia found that 43.5% of the article rejections were at least partially attributable to problems with the English proficiency. Furthermore, 33% of interviewed researchers would not attend international events because they had difficulties communicating in English. Finally, writing articles in English takes considerable time; costs for translation, which may be high; and difficulties in understanding the sections of articles in English.⁸ This provides just a glimpse of the difficulty imposed by language in the process of publishing science from Latin American countries, and presumably other geographic locations.

This Perspective paper discusses the need for strategies to reduce article processing charges (APCs), either paywalled or OA, and to promote inclusion of AD researchers from LMICs in the publication system, using a standpoint from authors in Brazil and Chile. First, we outline and comment on barriers imposed on LAC researchers in the publication process. In particular, the financial perspective will be addressed. Finally, we discuss potential strategies to reduce the disparities in neuroscience publishing.

2 | DEMENTIA RESEARCH IN LMICs AND HICs

Alzheimer's disease and related dementias (ADRD) represent a global health problem as their prevalence and projected numbers for the coming decades have steeply increased.⁹ Despite intense research and recent progress, much remains to be discovered in relation to basic

RESEARCH IN CONTEXT

- 1. Systematic Review:** We performed a literature search looking for articles that discuss the barriers to publishing scientific articles on Alzheimer's disease and neuroscience, aiming to compare low and middle-income (LMIC) and high-income (HIC) countries. In addition, we performed an internet search to detect initiatives to promote and support research in the areas mentioned above.
- 2. Interpretation:** There are barriers of different origins (limited research funding, publication costs, less access to grant opportunities) that hinder researchers from LMIC countries.
- 3. Future Directions:** Strategies that equalize the chances of publication for researchers from all over the world must be planned so that the scientific production of LMICs is properly considered.

mechanisms, diagnostics, therapeutics, and dementia care. Moreover, the impact of dementia is unequally observed worldwide, as LMICs present the majority of cases of dementia while having less resources to treat them than in many other geographic regions.¹⁰

LMICs struggle with significantly limited health, social, and economic indicators.¹¹ Consequently, they benefit less from scientific development/discoveries.¹² Moreover, due to the insufficient research funding and difficulties in publishing and accessing scientific information, they are gradually excluded from the science process, generating even more inequalities, and delaying the much needed social, economic, and political improvements.¹³

Between 1988 and 2017, the United States, England, Germany, and Japan published 71,319, 15,903, 13,024, and 11,703 papers on AD, respectively, while Brazil published 2824.¹⁴ However, as an example, Brazil was the second country in the world to register the highest prevalence of AD and other dementias in 2016 (estimated prevalence of 1037 cases per 100,000).¹⁵ In the same period, a prevalence of between 700 and 800 per 100,000 people was reported in the United States.¹⁵ Thus, using data from Brazil, the inequality between the production of scientific knowledge of LMICs and HICs is evident, thus demonstrating that the growth in scientific production in Brazil is not proportional to the prevalence of the disease.

Some other questions emerge when the inequality of scientific production in health research is considered. As the production of science between LMICs and HICs is arguably inequitable, elements relevant to LMICs, such as race/ethnicity, socioeconomic factors,¹⁶ education levels,¹⁷ health service access,¹⁸ and social determinants of health¹⁹ are underrepresented in science. Ultimately, this can even mean distortions in the external validation of study results^{20,21} and in the generalization of findings.

Considering the case of publications on multimorbidity of chronic diseases as an example, LMICs record 73% of the deaths from chronic

disorders worldwide, while only 5% of publications in the field come from these countries.²² The same study revealed the need to encourage increased collaboration between LMIC and HIC researchers.²² The lack of participation of LMIC researchers in health-related scientific publications²³ reflects another face of an unequal process of knowledge production worldwide, as it shows insufficient opportunities for LMIC researchers to effectively contribute to research design, data analysis, and interpretation of findings in studies that are relevant for the whole globe.

Traditionally, HICs have pioneered dementia research, with animal and human studies revealing key findings that improved our global understanding of dementia. Fortunately, the lack of diversity has recently gained acceptance as a relevant issue in science, and very recent initiatives have considered the inclusion of multiethnic and admixed cohorts in clinical trials, as well as researchers from diverse socioeconomic and cultural backgrounds in science. Furthermore, these actions have stimulated basic and clinical research in world regions that are traditionally underrepresented in the field. Moreover, the amount of impactful research coming from LMICs has consistently grown. This is in line with the notion that LMICs will likely continue to be mostly affected by new cases of dementia,^{10,24} which has led some countries and institutions to outline regional and national strategies to fight dementia.³ These initiatives include the Strengthening Responses to Dementia in Developing Countries (STRIDE) network, aiming to develop strategies to fight dementia in LMICs,²⁵ and Latin American Brain Health Institute (BrainLat)²⁶ and the Latin American and the Caribbean Consortium on Dementia (LAC-CD),²⁷ the latter two aiming to facilitate dementia research in Latin America.

However, resources destined for research and development are unequally distributed around the globe. HICs have historically recognized the benefits of investing in scientific research and the expected tradeoffs to society. Conversely, LMICs have struggled to provide a nourishing scenario to researchers due to a number of reasons.²⁸ At the core of the problem, policy makers rarely prioritize funding for research in such nations, ultimately missing unique opportunities to understand population trends toward optimal allocation of resources to frequent problems faced by their people.²⁹ This lack of priority may be explained not only by financial restrictions and economic priorities but also by a lack of strategic perspective in science investment. Nonetheless, HICs and LMICs essentially reveal distinct scenarios regarding research funding.³⁰

In general, authors from HICs represent the majority of scientists who share their work in high-impact health research journals.³¹ Researchers from HICs frequently co-author studies conducted in LMICs, but this trend rarely happens in the opposite direction. A comparative analysis of public research funding performed among seven HICs⁴ identified a positive trend in the amount of research resources, and the science budgets will likely continue to increase over time in HICs.⁷

An unfavorable setting emerges from these considerations, insofar as researchers are obligated to find provisional solutions to remain competitive in their careers. Universities and researchers from LMICs willing to increase their impact are often required to collaborate with

researchers from HICs to share funding as a means of survival. As a result, while LMIC researchers have increasing relevance in publishing high-impact data and meet standards for authorship, they are rarely leading or corresponding authors of such publications,²³ with downstream negative impacts on recognition and career advancement. Reasons for this lack of recognition are variable but include less power on negotiations with groups from HICs, specific requests for additional experiments using gold standard approaches that are only available in restricted HIC labs, country-level specific hurdles that preclude the full development of a medical/biomedical project in labs from LMICs, among others.

Nevertheless, LMICs offer unique opportunities in dementia research for several reasons. Operational costs are significantly lower in LMICs compared to HICs, which is often associated with unfavorable currency and reduced personnel costs. For example, a 3T non-contrast brain magnetic resonance imaging (MRI) scan in Brazil may currently be performed in a tertiary service hospital at BRL 250 (estimated \approx 50 USD), whereas in the United States, the average cost is \approx 1600 USD.³² Although direct comparisons need to be evaluated with caution, this suggests that for every brain scan in the United States, one can perform up to 32 brain scans of the same quality in Brazil. Human resources and equipment are readily available in tertiary services and research centers in large cities such as São Paulo.³³ Notably, Brazil and Chile present a proportion of MRI machines that is comparable to some HICs, including Canada.^{34,35} Moreover, LMICs often present populations from distinct ethnicities, racial origins, and multicultural backgrounds, potentially increasing the external validity of study results.³⁶

3 | CHALLENGES FOR RESEARCH IN LMICs

LMIC researchers face innumerable barriers to contributing to scientific research in leading positions. Those few that achieve that level are usually grounded in research that is co-affiliated with institutions from HICs³⁷ and, in some cases, after a few years, move to HICs to establish more competitive labs. The challenges faced by research groups in LMICs jeopardize the development of high-quality science and research scientists; such barriers are rooted in the educational system and political context of these countries. Among many socio-political obstacles to conducting studies, some are grounded in every research group in LMICs, including language barriers, underpaid research positions, lack of career perspective, and a fundamental access to funding opportunities.

Myriad reasons contribute to hindering research in LMIC. Although not surprising, a fundamental access to funding opportunities is a reality in these countries.³⁸ Frequent budget cuts and the resulting financial barriers to producing research and publishing play important roles in distancing HICs and LMICs. APCs comprise one such integral part of this problem. In Brazil, publication fees are often multiple times higher than the national minimum wage, which is \approx 253 USD. The fraction of the Brazilian gross domestic product (GDP) devoted to science reaches only 0.63%, with hopeless expectations,³⁸ denoting

substantially limited funding provided to all areas of research. In Chile, despite the growing number of projects demanding resources yearly, the total amount of funding for research has been stalled for years.³⁹ The examples posed by Brazil and Chile represent a reality for many LAC countries, whereas other countries may present an even worse reality.⁴⁰ Nations with lower GDP, such as Guatemala, present an even lower number of researchers, while other countries lack data.⁴¹ Therefore, those who choose to stay on the research track are cornered by the access to funding opportunities, underpayment, a highly competitive environment, and APCs that can be higher than their own salary. In this section, we focus on describing and discussing structural barriers related to the publication process, such as publication fees and language barriers. We further address and discuss country-level barriers, including science funding and career development and perspectives. It is necessary to highlight that researchers from other countries also suffer from the same barriers, which reinforces the need for the discussion brought about by this article. Thus, in India, paying publication fees can be a barrier;⁴² in China, there are problems with English proficiency;⁴³ research funding in Africa proves to be a barrier;⁴⁴ and problems with career advancement occur in Singapore.⁴⁵

3.1 | English language as a barrier to publishing

Because most LMIC academics are not English native speakers, they face a language barrier at the very beginning of their academic journey. Previous data point out that < 5% of Brazilian individuals speak English and < 1% report fluency.⁴⁶ Although public education is widespread throughout the nation, the quality of teaching is rarely sufficient to train students to read and write in a foreign language. Thus, adequate training in formal English skills becomes critical for any research career progression. Besides learning methods and field-specific advances, young and ascending researchers in LMICs have additional demands communicating in a non-native language with few opportunities of learning it locally. Of note, a study in Colombia showed that the production of scientific papers and the impact factors of the journals are compromised because of language issues, showing one of the disadvantages LMIC researchers face in publishing.⁸

3.2 | Academic barriers

Undergraduate students in LMICs are usually initiated in research later in their trajectory. For those moved by science and willing to pursue a career as a scientist, a challenging and very difficult road with very few job opportunities must be traveled. Trainee positions in LMICs are seldom formally recognized and typically underpay their candidates compared to other professional activities.⁴⁷ When available, an academic position supposedly dedicated to research includes an abnormal workload caused by a multitude of other functions, such as teaching, administration, technical support, and compulsory participation in committees, among other tasks, that generally exceed similar challenges in HICs. The lack of sufficient faculty positions and technical

staff contributes to this scenario. As a natural consequence, there are 56 times fewer health researchers in LMICs than in HICs.⁴⁸ Students looking for a research position in LMICs are typically discouraged by this suffocating scenario, ultimately abandoning their academic career or migrating to resource-rich countries in a “brain drain” tendency.⁴⁹

3.3 | Research funding constraints

The governmental investment in science, technology, engineering, and mathematics (STEM) in LMICs, notably in LAC countries, is markedly lower than in HICs. Perhaps the most important factor contributing to inequality in science is the imbalance in funding for research. Although attempts to mitigate this condition have been carried out by some governmental initiatives, most LMICs cannot afford to provide resources within their own countries.⁵⁰ LAC researchers are disadvantaged by smaller budgets and less access to grant opportunities.⁴¹ Limited access to grant opportunities, insufficient budgets, poor laboratory infrastructure and equipment, high cost of reagents and laboratory supplies, and the inadequate salaries of scientists in LAC countries are thus major factors contributing to reduced scientific productivity.⁷

Even for professionals dedicated to full-time research, the scenario is impractical, as current predoctoral scholarships pay approximately 6200 USD yearly, and a postdoctoral salary reaches approximately 11,000 USD yearly in Brazil or Chile. Further, neither doctoral nor postdoctoral jobs are eligible to count for pension schemes. At a larger scale, the severe loss of funding in Brazil has interrupted many projects over the past 4 years, as only US\$5 million per year were invested in research grants in all areas of research nationwide,⁵¹ while the US government invested US\$606 billion in research.⁵² Such an enormous disparity in research quality reflects the context of research scarcity in LMICs.

3.4 | Publication and publishing costs

Charging disproportional fees for publication or access to scientific literature in health sciences encourages and expands the existing scientific disparities between LMICs and HICs. This emerges as another obstacle that needs to be overcome in search for equitable production and access to scientific knowledge.

It is noteworthy that the process of producing, editing, and publishing scientific articles is not cost-free. Expenses with human and material resources (computers, software, websites) are required to make information accessible to interested parties. However, the unavailability of transparent data about the costs of the science publishing industry makes it hard to understand and discuss the existing expenses and fair revenues.

A 2011 estimate indicated that the average cost of publishing an article would be ≈\$5000.⁵³ The profit margin of publishing companies estimated by analysts would be between 20% and 30%. As a result, publishers would likely spend \$3500 to \$4000 to produce a paper.⁵³

It should be noted that this production expense can be overestimated as some publishing companies charge lower rates for the publication of articles.

Publication fees in dementia-relevant journals are ≈\$3000 (*Alzheimer's & Dementia*),⁵⁴ \$2200 (*Alzheimer's & Dementia: Translational Research and Clinical Interventions*),⁵⁵ and \$3590 (*Alzheimer's Research & Therapy*).⁵⁶ Applying a 25% profit margin, one can envision that the cost of production would be \$2250, \$1650, and \$2692.50, respectively. However, production costs for articles between \$290 and \$300 have been reported by smaller publishers.⁵³ It is also noteworthy that reviewers and editors are seldom paid for their work and many journals have adopted an online-only format, which likely offsets the costs for the publishing industry.

A main point that draws attention in the costs shown is the difference in the amounts charged by the journals, from which a reflection arises: would the paper production processes be so different among publishing companies, or among lower and higher impact journals, as to justify the observed variations? The lack of transparency in production costs does not allow us to clarify this issue at the moment.

3.5 | Impact of publication fee policies on dementia research

This positive momentum in dementia research is jeopardized by the dominating publishing model in which high publishing fees (astronomical in some contexts) are charged to authors upon acceptance of an article, or when the science community is prevented from reading a publication unless they, their institution, or their funding agency pay for access. As mentioned above, research grants in LMICs are insufficient and generally do not include supplements to cover such fees.

Some newer journals are open access-only and force authors to pay high fees to make research freely available to readers. While open access journals are important outlets for science dissemination, paywalled journals may be preferred by LMIC authors for their overall reduced publishing cost. Studies published in these journals are ultimately restricted to those who pay to read, which deepens the scientific inequality among HICs and LMICs. Some initiatives already in place should be mentioned. Some paywalled journals offer open access to articles after 12 months of publication. However, given that the need for quick access to scientific knowledge is increasingly pressing, this may significantly delay science progress. The COVID-19 pandemic further revealed the pressing need for open and fast science progress. Preprint platforms comprise an alternative for open access to scientific knowledge by LMICs, though reflections on the absence of peer review and the quality of reporting and content of the published material have been discussed in the literature.⁵⁷⁻⁵⁹

Therefore, pay-walling practices represent a bottleneck for publication and dissemination of findings that could stimulate further research, collaborative work, and science advancement in LMICs. For instance, these publishing drawbacks reduce the traction and hinder competitiveness of LMIC research groups for international grant schemes that, in turn, discourages further research.

4 | OPPORTUNITIES AND PERSPECTIVES IN REDUCING THE SCIENTIFIC INEQUALITY BETWEEN HICs AND LMICs

In a field dominated by the general disappointment triggered by sequential failures in clinical trials, collaboration and rapid dissemination of findings are essential to prevent and combat dementia. Therefore, creating strategies to overcome the publishing barriers and fostering dementia research in LMICs is imperative. Currently, the most common approach to reducing inequities in science publication is to offer partial or full waivers for research originated from LMICs or resource-limited countries.^{60,61} However, these waiver mechanisms vary considerably.

Some journals (including some from Springer Nature) require official proof of low funding status to grant waivers on a case-by-case basis. Other journals, such as some from Wiley, use the World Bank classification to generate a list of countries that are eligible to request a waiver. This latter scenario is problematic, as funding may fluctuate within institutions and groups from the same country and over time. For example, in a large country, such as Brazil, there is considerable inequality within national research. Further, social conditions and science funding dramatically dropped over the past 7 years, whereas World Bank classification of Brazil remained stable as an upper-middle income country. Another example is Chile, considered an HIC, whereas the national science scenario is more closely related to LMICs.

The mounting dissatisfaction with high publishing costs and inaccessibility of research has guided some actions from institutions and governments in developed countries. Revised agreements with the publishing industry, such as the US plan to make publicly funded research immediately available⁶² and the Plan S, an initiative to foster open access publication of results funded by European public agencies, are some examples of this recent move.⁶³ However, such strategies would not work adequately in LMICs should the same financial constraints persist in their research systems.⁶⁴ In addition, the expansion of open access journals with a reduction in the paywalled outlets would be a potentially detrimental consequence for LMICs if open access fees become dominant.

Increasing diversity and LMIC representation on editorial boards and in journal leaderships, as recently done by *Alzheimer's & Dementia: Translational Research & Clinical Interventions* and *eLife*, might aid in turning the publishing industry more sensibly to the challenges faced by science in resource-limited countries. Fostering society or community-driven journals may also contribute to less inequality in science publishing. Furthermore, international institutions provide important support to LMIC researchers by providing grants dedicated to promoting diversity, such as the Alzheimer's Association grants and the Wellcome Trust. Despite not fully reducing the financial barrier to publishing, these initiatives strengthen research groups and provide support to increasing the competitiveness of LMIC researchers.

Although LAC countries have seen an increase in the number of its scientists and research institutions in recent years, the gap between LAC countries and HICs is still enormous, especially in the number of dementia professionals. Thus, LMICs, notably LAC countries,

TABLE 1 Institutions that foster international collaboration by providing funding to research and to researchers.

International research grants	Fellowship grants
Alzheimer's Association	Alzheimer's Association
Wellcome Trust	Wellcome Trust
Medical Research Council (MRC—UK)	Global Brain Health Institute
Economic and Social Research Council (ESRC—UK)	Fondation Vaincre Alzheimer
Institut National de la Santé et de la Recherche Médicale (INSERM)	Fondation pour la recherche médicale (FRM)
Deutsches Zentrum für Neurodegenerative Erkrankungen (DZNE)	Brightfocus Foundation
National Health and Medical Research Council (NHMRC)	Local and regional research funding
Bill and Melinda Gates Foundation	
Local and regional research funding	
Alzheimer's Drug Discovery Foundation	
BrightFocus Foundation	

urgently require the development of harmonized, innovative, multisectoral, educational, and regional centers focused on brain health and dementia research. BrainLat was recently created to tackle many of these challenges,^{26,65} increasing regional capacity building by ongoing consortia, including LAC-CD,²⁷ and the Multi-Partner Consortium to Expand Dementia Research in Latin America (ReDLat).⁶⁶ Another possibility for expanding AD research capacity in LMICs is the grants and fellowships offered by institutions around the world. They play a leading role in supporting researchers from different countries. Table 1 summarizes some of the institutions that offer these opportunities.

Language barriers could be reduced by implementing some initiatives. Scientific journals could offer low-cost or free English consultation services for high-quality articles from LMICs. Projects to support the improvement of language skills could also be hosted by leading scientific journals: free webinars, courses, and events aimed at training and offering resources to LMIC researchers would be useful. In addition, platforms that promote mutual learning, allowing native English-speaking researchers to be in collaborative contact with LMIC researchers seeking assistance with language would be another possibility. Taken together, these initiatives will accelerate opportunities to improve brain health by connecting stakeholders, universities and institutions, governments, and non-governmental organizations toward the common purpose of fighting dementia.

5 | FINAL REMARKS

Considering the field of research in AD, this Perspective paper provides an overview of the background, challenges, and opportunities experienced by LMIC researchers in the process of publishing their scientific findings. Figure 1 summarizes these elements so the reader has a more comprehensive overview, hopefully providing a broader perspective.

The need to plan strategies to facilitate scientific publication for LMIC researchers is clear. Difficulties with the publication process and access to literature contribute to hinder advancement in LMIC science. In addition, expensive and unsustainable page charges impede publish-

ing of good quality science produced by LMIC scientists and impact the ability of those researchers to produce more knowledge. This challenging scenario proves to be particularly harmful to researchers in LAC countries, where the sustained lack of investment leads to additional barriers in publication, thereby making these researchers less competitive and exacerbating both funding constraints, knowledge creation, and career advancement. Some recently implemented network initiatives, particularly in LAC countries, hold promise to alleviate disparities, although additional strategies to foster dementia science in LMICs are needed.

Some initiatives aimed at contributing to equity in science, such as offering discounts to LMIC researchers, have already been implemented by some scientific publishing companies. These programs, however, need greater consistency and adherence to have a broader positive impact. Finding a constructive solution to reduce publication barriers and improving representation of LMIC researchers is an endeavor involving authors, editors, science institutions, publishing houses, and funding agencies worldwide.

Some important questions arise from these reflections: (1) How to make the publishing process fairer for LMICs while economically viable for the community? (2) Would offering more discounts to LAC or LMIC researchers be enough to make the process fairer? Definite answers to these questions are not straightforward and require thoughtful proactive consideration. However, the discussion we propose here needs to be echoed to raise awareness and stimulate researchers and publishing companies in the search for more equitable strategies for science. Ultimately, successful implementation of such initiatives will benefit the critical need for productive translational research and clinical interventions to alleviate the global burdens imposed by ADRDs.

In sum, scientific publications are unequally distributed, funded, and supported around the globe. Researchers in LMICs and resource-limited settings struggle to compete with HICs due to several reasons discussed in this perspective. Among the measures to promote diversity and inclusion of authors originating from these settings, the reduction of APCs should be a major factor to reduce inequality among LMICs and HICs.

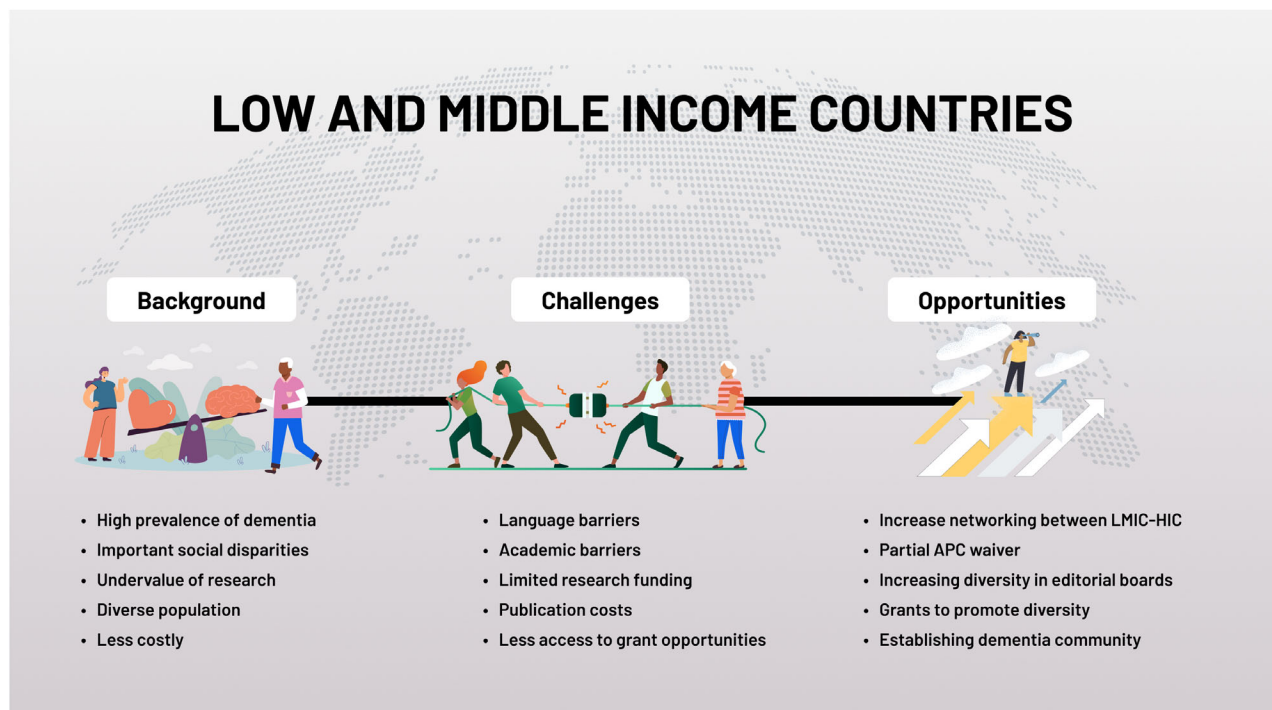


FIGURE 1 Publishing barriers to research from low- and middle-income countries overview: challenges and opportunities in the scientific publishing in Alzheimer's disease and neuroscience. APC, article processing charges; HIC, high-income country; LMIC, low- and middle-income country.

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CONSENT STATEMENT

Informed consent was not required in this study because human subjects were not involved in the research.

AUTHOR'S NOTE

This is a peer-reviewed invited Perspective that resulted from discussions and interactions between Dr. Shamy Castro and the other authors, who are South American handling Editors for Alzheimer's & Dementia: Translational Research & Clinical Interventions (A&D TRCI). During the review process, one of the reviewers correctly raised the important issue of gender imbalance in the author list. When initially discussing the concept of crafting this perspective article with the communicating author Dr. Shamy de Castro, the Editor-in-Chief of A&D TRCI, Dr. Barry Greenberg suggested that he connect with the other members of the TRCI Editorial Board from South America. It was through this collaboration that the article was developed. Thus, the author team was comprised of five individuals, four of whom are TRCI Editorial Board members, one of whom is female and another a person of color. The authorship team was designed to represent a Latin American perspective rather than focusing on societal diversity as a focus, despite the fact that the TRCI Editorial Board was evidently planned to represent broad geographic and gender diversity (we note that the 87 individuals on the TRCI Editorial Board across 17 countries from

5 continents, 39 are women and 48 are men). As a small representative sample, the 4 Editorial Board members from South America do not match this overall diversity. However, by this note, all authors of this Perspective acknowledge and agree that gender imbalance is a matter that should be urgently addressed in science globally, not only in low- and middle-income countries. Inclusion of women and genders that reflect more than merely biological sex at birth should be made effective in all science settings (institutes, journals, companies, etc). Gender diversity needs prioritized attention for adequate science perspectives and progress.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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