

Mitigating Research Disparities in Neurosurgery: Smiles but still Miles in the Isles.

Ignatius Esene^{1,2,3}, MD, M.Sc, PhD, MPH, Andrés Rubiano⁴, MD, PhD

¹Deputy Editor-In-Chief¹ and Publication Director⁴, Journal of Global Neurosurgery

²Neurosurgery Division, Faculty of Health Sciences, University of Bamenda, Bambili, Cameroon.

³Research Division, Winners Foundation, Yaounde, Cameroon

⁴Universidad El Bosque. Bogotá, Bogotá, Colombia

Research is a critical pillar for the advancement of neurosurgical education and practice. This aspect is growingly viewed as a fundamental engine of academic activity and productivity. Although neurosurgery research has witnessed a marked improvement in quality and an exponential increase in outputs, there are still inequalities and inequities in neurosurgery research worldwide with specific consequences.

Determinants of research disparities have been identified and include: non-native language, female gender, limited funding, inadequate research infrastructure, researcher's geographic location and affiliation in a low-and-middle-income country (LMIC), geographic origin of neurosurgical journal in a high-income country (1, 2), competing clinical demands, limited research training and opportunities (2). *But what are research disparities?* Research disparities are preventable differences in research outcomes and output in groups or populations as a result of social structure, access to services and infrastructure, and other health system related factors. Research equity is the representation of authors across the globe through mitigation of socioeconomic factors that impact their ability to publish their work (1). Research is a core element of global neurosurgery and informs the pathway to increase access to neurosurgical care and reduce disparities worldwide (1). However, analyses of current global neurosurgical publications have shown disproportionate representation of authorship (3).

Research inequities are not without Consequences. The underrepresentation of LMICs research can lead to the development of biased/skewed guidelines in favor of HICs and limits knowledge transferability of the generated evidence. As an example, most neurotrauma research comes from HICs but the greater burden of traumatic brain injury (TBI) is from LMICs. Then, how generalizable and applicable are TBI guidelines in LMICs?

Given the disproportionate burden of TBI, LMICs-led research should be promulgated, since local stakeholders possess relevant perspectives to prioritize and foster germane research, investigate pertinent questions, and formulate sustainable neurotrauma policies. One bright spot in the recent neurosurgery trends is the increased research

Correspondence to:

Ignatius N Esene, MD, MSc, PhD, MPH
Neurosurgery Division, Faculty of Health
Sciences,
University of Bamenda, Bambili, Cameroon.
Email: ignnatiusesene@yahoo.co.uk
Tel : +237672783842

productivity in LMICs. Nonetheless, a major gap persists as we still have a long way to erase research inequities in Neurosurgery.

Research inequities can be mitigated via a number of mechanisms such as research capacity building and active implication of journals.

Research Capacity Building

Research capacity building of research stakeholders in LMICs has been shown to be one of the key ways that international health bodies can create sustained benefit in these countries(4). Evidence points that focusing on research capacity building has had a significant role in strengthening health systems(4), neurosurgery inclusive.

Notably, national health research capacity is a crucial component that enables LMICs to identify and progress their national health priorities. We have thus in recent years organized and supported research courses across many countries viz.: Cameroon, DR of Congo, Ethiopia, Benin, Iraq, Egypt, Turkey, and Columbia just to name a few.

At the regional level, for example, the Continental Association of African Neurosurgical Societies (CAANS) has developed and implemented a yearly research course/workshop for its young neurosurgeons after an initial phase of sensitization. Similar courses have been organized in other continents underscoring the importance of developing research capacity to curb research disparities.

At the global stage, the Global Neurosurgery committee of the World Federation Of Neurosurgical Societies had as one of its five objectives, to advance relevant research, especially from authors in LMICs with achievable targets as expounded in this current issue. The initial step was to Map research output by region and themes to understand existing gaps and barriers especially in LMICs.

Implication of Journals and Journal Editors

The role of Journals and journal editors in advancing global health research equity is well documented in other specialties(5). The Journal of Global Neurosurgery (JGNS) along side other journals has been championing this cause and has charted a course for the operationalization of global neurosurgery research in neurosurgical journals as underscored by Servadei et al (6). A leading neurosurgery periodical such as “Neurosurgery Journal” has sections for global neurosurgery and Evidence-Based Medicine of which research is one of the pillars while “World Neurosurgery” in 2022 called for a special issue on Research Methods. The JGNS has been championing the cause for research equity. JGNS was created with a main mission to empower researchers from LMICs and freely disseminate ideas and knowledge about GNS hence J GNS is an open access journal, no Paywall and no Article Processing Charges (APC). Further actions taken by the JGNS to mitigate research disparities include:

-Establishment of Global Neurosurgery (GNS) research grant and/or award and funding mechanisms for training future leaders in the public health practice of GNS. Researchers from LMICs face many challenges and barriers, such as inadequate protected research time and insufficient funding. The JGNS

is collaborating with The Neurosurgery Outreach Foundation (NOF) to provide the “Global Neurosurgery Research Award” (for Neurosurgery-related research performed by researchers from LMICs).

- Establishment of mentoring relationship between authors from HIC and LMICs (*JGNS Editorial Mentorship Program*). Equitable Editorship is exemplified in the JGNS by its inclusiveness and the diversified representativity in its editorial board.

- Provision of language and editorial support to authors especially from LMICs (*JGNS Editorial and Language Support programs*). In fact, language discordance represents a major barrier to research equity in neurosurgery, limiting dissemination of ideas of merit that currently have inadequate outlets for readership (1) and journals have a responsibility in advocating for the representation of neurosurgeons whose primary language is not English (1). Worth noting is that most LMICs are non-Anglophone thus limiting their access to English language research training and journals(1).

Furthermore, since research is a core element of global neurosurgery and issues related to research equity are usually discussed during GNS sessions, GNC advocates for Global Neurosurgery category/sections in major neurosurgery journals and Inclusion of Global Neurosurgery Sessions in major neurosurgery meetings.

Equitable Authorship in Publications

The heightened Interest in GNS in recent times has resulted in the concomitant surge in the number and complexity of research partnerships between high-income countries (HICs) and LMICs, igniting questions around authorship parity.

Interestingly, while the number of neurosurgery publications and scholarly impact is soaring, the majority of global neurosurgical publications regarding LMICs are frequently written by authors in HICs(7). Studies have demonstrated substantial under-representation of authors affiliated with LMICs when studies are conducted in LMICs(8). Reported concerns in authorship range from authorship parasitism (no authors from study countries) to authorship disparity (inequitable representation and author order). HICs authors usually take the first and senior authors’ positions than authors from the study countries (in LIMC). Ghost and gift authorship are further issues decried.

Gender disparities in authorship, authorship position, editorship have been highlighted and also need to be redressed. An analysis of sex-based authorship trends demonstrated increased sex disparity with neurosurgery trailing behind other specialties in the paucity of female neurosurgeons in research productivity(9).

Furthermore, even within countries of same income groups, senior neurosurgeons in some settings claim unmerited first and last authorship positions at the detriment of junior staff members. Ghost and gift authorship for senior staff members are common practices in such settings.

There is a dire need for guidelines/consensus statement from international partners to promote equitable authorship in the publication of research as in other specialties (10). The adoption of guidelines to promote equitable authorship practices for research work conducted in LMICs by journals is a necessary initial step towards reducing authorship disparities in global health research and “decolonizing” global health authorship(8). Where LMICs authors make substantial contributions,

researchers should strive for authorship parity. There is thus an urgent need for a “Neurosurgery Research Equity Act”.

Future Perspective

To avert these inequities and improve global neurosurgery research, there is need for a framework/guidelines that emphasizes local representation, research capacity building and implication of neurosurgical journals and international GNS programs. Such collaborative research equity guidelines such as proposed by Patterson et al. (2), should include stakeholder analysis and participation, early and clear definition of roles and responsibilities, attribution of authorship and authorship positions based on meritocracy, and study validation by experienced researchers.

Attention should be focused on Mentorship, education, infrastructure, impact and engagement which have been identified as specific accelerators to conducting and disseminating clinical research in LMICs (11).

Furthermore, there is need for Initiatives geared at increasing the accessibility of neurosurgical publishing to underrepresented authors and publications to end users.

Equitable research collaborations benefit the quality, relevance, generalizability and applicability of global neurosurgery research (2).

Research inequities are real. Although some smiles have been observed, we are still miles in the isles with regards to the mitigation of the determinants of research disparities.

“The difference between equity and equality is that equality is when everyone gets the same thing, and equity is when everyone gets the things they deserve.” DeRay Mckesson (Activist)

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