

## Letter: Addressing Neurosurgery Research and Data Access Gaps in War-Inflicted Nations

To the Editor:

For decades, neurosurgical research in war-torn countries has been subpar, owing to a plethora of factors that limit data accessibility and quality research. These countries are frequently affected by ongoing conflicts, which divert resources away from effective health care and research outcomes. Furthermore, they lack adequate institutes of higher education, where clinical and research excellence paves the epicenter of research institutions, trained personnel, and infrastructure, making high-quality research difficult.<sup>1</sup>

Underreporting and misrepresentation of neurosurgical outcomes are mostly attributed to an absence of critical infrastructure, such as specialized tertiary neurosurgical centers alongside communication networks and transportation, which proffers a significant barrier to data collection and documentation concerning neurosurgical cases. Several studies have identified the challenges faced when obtaining demographics and critical data on various conditions. These comprise traumatic brain injuries, spinal cord injuries, and cranial and spinal fractures, among others in war-torn nations due to inadequate or lack of vital infrastructure.<sup>2-5</sup> Furthermore, the scarcity of neurosurgical personnel makes it arduous for these war-torn countries to conduct effective research. Iraq and Syria have fewer neurosurgeons per capita than the global average of 1 neurosurgeon per 100 000 individuals.<sup>6</sup> Iraq has only 1 licensed spinal surgeon, and Syria has none.<sup>7</sup> The few available neurosurgical workforce in these conflict-torn domiciles has too much neurosurgical sequela to mitigate, facilitating the prioritization of patient care over research endeavors.<sup>7</sup>

Several studies have elucidated that collating accurate data in these war-inflicted nations is sometimes difficult. Confinement of home and hospital visits as well as unsafe conditions in most districts results in smaller sample sizes and potential sample bias.<sup>8,9</sup> Conversely, Michael et al observed that findings associated with neurosurgical cases may not be entirely accurate or representative of the overall population. This was due to data accessibility restrictions, which prevented the researchers from obtaining a comprehensive sample size that accurately reflected the population.<sup>9</sup>

Rosseau et al<sup>4</sup> also reported that the prevalence of neurological and neurosurgical diseases in African war-torn countries such as Somaliland had never been epidemiologically assessed. The country's relatively recent deployment of data collection techniques and resources makes surveying the incidence and prevalence of neurosurgical disease more difficult. In addition, poor record keeping has been identified in a study conducted in the Democratic Republic of the Congo (DRC), as it is frequently manual and fragmented, making it challenging to collect and analyze data systematically to critically evaluate neurosurgical cases.<sup>10</sup> There is a significant lack of standardization in data

collection and reporting, precipitating challenges in data comparison across regions. Furthermore, there is a scarcity of resources dedicated to health research, limiting the ability to conduct large-scale studies.<sup>10</sup>

There is a notable deprivation or lack of studies in the literature concerning neurosurgical research capacities in the most war-torn countries, including Ukraine, Somalia, South Sudan, Libya, and the DRC. Even the war-torn countries that have published extensive neurosurgical articles are woefully inadequate, with huge disparities compared with other non-war-inflicted nations. For instance, Ammar et al<sup>11</sup> highlighted such disparity and scarcity of high-quality, comprehensive literature reflecting Afghanistan's neurosurgery capabilities. Only 15 articles were identified as relevant to neurosurgery and having a connection to Afghan neurosurgeons and/or patients across clinical trial sites. This deprivation of studies reflects a critical lack of comprehension concerning the current state of neurosurgery and related health issues in said countries. The knowledge gap poses significant challenges for policymakers, international organizations, and other stakeholders who rely on research to make informed decisions. Designing effective interventions to address the issues faced by these countries becomes difficult without a clear understanding of research capacity.<sup>4</sup> Moreover, the absence of sufficient research on neurosurgery in these areas may have grave repercussions for patients because it is a very intricate field that requires skilled staff and advanced technology. Without sufficient research, medical professionals may not be able to fully understand the best practices for managing certain conditions.

Several recommendations must be implemented to improve the quality of neurosurgical care and research in war-torn countries. Adequate funding and resources should be provided for effective neurosurgery delivery in these war-torn nations. This can be further improved by establishing public-private partnerships to leverage resources. For example, the International Committee of the Red Cross (ICRC) has a well-established track record in providing support, and a partnership between the ICRC and neuroscience institutes could help improve neurosurgery delivery in war-torn nations.

Building local capacity, which includes training local health care providers, researchers, and staff to conduct research, is one way to develop a resilient research program. It is also critical to train these local researchers on how to conduct effective research with limited resources due to these war-torn nations' financial constraints. Governments and stakeholders should also prioritize investing in neurosurgery workforce capacity by providing training opportunities for neurosurgeons and building more neurosurgical training centers in war-torn nations. Long-term neurosurgery training and research strategies are required in chronic war-torn nations. These may include constructing underground specialized training and research centers that can

withstand shelling, as well as incorporating effective distance or telelearning into the training programs. By implementing these strategies, trainees and residents can be assured of their safety, while also having opportunities to learn from international experts.

Renowned and influential organizations, such as the United Nations and governments of war-torn countries, should ensure adequate security for local and volunteer neurosurgery workforces who travel to these active conflict zones to save lives and also conduct crucial research activities. In addition, bordering countries to these war-torn nations may provide necessary assistance and facilities for these volunteers' effective operations.

### Funding

This study did not receive any funding or financial support.

### Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

**Favour Tope Adebuseye, MBBS** \*

**Wireko Andrew Awuah, MBBS**\*

**Niranjna Swaminathan, MBBS**‡

**Shankhaneel Ghosh, MBBS**§

**Jack Wellington, MSc (LSHTM), FGMS**||

**Toufik Abdul-Rahman, MBBS**\*

**Ovechkin Denys, MD, PhD**\*

**Volodymyr Lychko, MD, PhD**\*

\*Faculty of Medicine, Sumy State University, Sumy, Ukraine

‡Faculty of Medicine, Taylor's University, Selangor, Malaysia

§Faculty of Medicine, Institute of Medical Sciences and SUM Hospital, Siksha 'O' Anusandhan, Bhubaneswar, India

||Cardiff University School of Medicine, Cardiff University, Cardiff, Wales, UK

### REFERENCES

1. Trelles M, Dominguez L, Tayler-Smith K, et al. Providing surgery in a war-torn context: the Médecins Sans Frontières experience in Syria. *Conflict Health*. 2015;9:36-38.
2. Dubinski D, Kolesnyk V. War in Ukraine: a neurosurgical perspective. *Acta Neurochir*. 2022;164(12):3071-3074.
3. Abdallah YE, Beveridge J, Chan M, et al. Devastating neurologic injuries in the Syrian war. *Neurol Clin Pract*. 2019;9(1):9-15.
4. Rosseau G, Kim EE, Barthélemy EJ, et al. The current state of neurosurgery in Somaliland. *World Neurosurg*. 2021;153:44-51.
5. Kocamer Şimşek B, Dokur M, Uysal E, et al. Characteristics of the injuries of Syrian refugees sustained during the civil war. *Turk J Trauma Emerg Surg*. 2017;23(3):199-206.
6. Mukhopadhyay S, Panchak M, Rattani A, et al. The global neurosurgical workforce: a mixed-methods assessment of density and growth. *J Neurosurg*. 2019;130(4):1142-1148.
7. Hoz SS, Tamer WA, Al-Awadi OM, Al-Sharshahi ZF, Dolachee AA. Neurosurgery training in war-torn countries: a perspective from Iraq and Syria. *Surg Neurol Int*. 2020;11:430.
8. Vinck P, Pham PN. Association of exposure to violence and potential traumatic events with self-reported physical and mental health status in the Central African Republic. *JAMA*. 2010;304(5):544-552.
9. Michael M, Roth K. Against all odds: a qualitative study of rehabilitation of persons with spinal cord injury in Afghanistan. *Spinal Cord*. 2012;50(12):864-868.
10. Tshimbombu TN, Kalubye AB, Hoffman C, et al. Review of neurosurgery in the democratic Republic of Congo: historical approach of a local context. *World Neurosurg*. 2022;167:81-88.
11. Ammar A, Nawabi NL, Hamzah R, et al. The current state of neurosurgery in Afghanistan. *World Neurosurg*. 2023;169:110-117.e1.

© Congress of Neurological Surgeons 2023. All rights reserved.

10.1227/neu.0000000000002527