Global neurosurgical workforce

The neurosurgical workforce refers to the global community of neurosurgeons responsible for diagnosing and treating disorders of the nervous system. As of recent estimates, there are approximately 72,967 neurosurgeons worldwide, equating to a global density of about 0.93 neurosurgeons per 100,000 people. However, this distribution is uneven, with high-income country averaging 2.44 neurosurgeons per 100,000 people, while low-income country has as few as 0.12 per 100,000.

The World Federation of Neurosurgical Societies (WFNS) has developed an interactive Global Neurosurgical Workforce Map to highlight these disparities and identify regions most in need of neurosurgical support.

Addressing the global neurosurgical workforce deficit is crucial, as an estimated 5 million essential neurosurgical cases go unmet each year, predominantly in low- and middle-income countries. To bridge this gap, strategies include expanding neurosurgical training programs, enhancing infrastructure, and implementing task-sharing models where non-specialist healthcare providers are trained to perform basic neurosurgical procedures.

Efforts to improve the neurosurgical workforce are ongoing, with organizations like the WFNS and the American Association of Neurological Surgeons (AANS) playing pivotal roles in promoting education, research, and policy development to ensure equitable access to neurosurgical care globally.

A sustainable neurosurgical workforce depends on robust training pipelines, but the size and distribution of the global neurosurgery trainee workforce have not been described. The objective of this study was to identify the types of training programs that exist in the global neurosurgery workforce, the support that trainees receive, the diversity of trainee experiences, and the accreditation processes that exist to regulate training programs.

Methods: This study was a subanalysis of a cross-sectional survey administered online in all 193 countries and 26 territories, independent states, and disputed regions as defined by the World Bank and the United Nations. Participants were identified through neurosurgery society leadership, the personal contacts of the coauthors, and bibliometric and search engine searches. Population-weighted statistics were constructed and segregated by country income level and WHO regions.

Results: Data were obtained for 187 countries (96.9%) and 25 additional territories, states, and disputed regions (96.2%). There were an estimated 1261 training programs and 10,546 trainees within the regions sampled, representing a global pooled density of 0.14 neurosurgery trainees per 100,000 people and a median national density of 0.06 trainees per 100,000 people. There was a higher density in high-income countries (HICs; 0.48 trainees per 100,000 people) compared with upper-middle-income countries (0.09 per 100,000), lower-middle-income countries (0.06 per 100,000), and low-income countries (LICs; 0.07 per 100,000). The WHO European (0.36 per 100,000) and Americas (0.27 per 100,000) regions had the highest trainee densities, while Southeast Asia (0.04 per 100,000) and African (0.05 per 100,000) regions had the lowest densities. Among countries with training programs, LICs had the poorest availability of subspecialty training and resources such as cadaver laboratories and conference stipends for trainees. Training program accreditation processes were more common in HICs (81.8%) than in low- and middle-income countries (LMICs; 69.2%) with training programs.

Conclusions: The authors estimate that there are at least 1261 neurosurgery training programs with 10,546 total trainees worldwide. The density of neurosurgery trainees was disproportionately higher in HICs than in LMICs, and the WHO European and Americas regions had the highest trainee densities. The trainee workforce in LICs had the poorest access to subspecialty training and advanced resources [1].

Although the world is experiencing a deficit in the neurosurgical workforce, the number of neurosurgeons in Germany has increased within the last two decades.

The aim of the study of Ringel et al. was to assess the neurosurgical workforce in Germany, compare it to European countries, and assess structures in neurosurgical departments in Germany.

Data regarding the number of neurosurgeons in Germany as well as the number of departments, beds, cases, and neurosurgical procedures were gathered. A survey among German neurosurgical departments was performed to assess the structure of neurosurgical care. Furthermore, another survey among European countries was performed to acquire information regarding the number of surgeons and the regulation of training.

From 2000 to 2019, the number of board-certified neurosurgeons in Germany increased by 151% from 973 to 2,446. During the same period, the German population increased by only 1% from 82.26 million to 83.17 million. Thus, the number of neurosurgeons per 100,000 inhabitants increased from 1.18 to 2.94. The increase of neurosurgeons is not paralleled by an increase in departments or an increase in neurosurgical procedures within the active neurosurgical departments. In comparison to the participating European countries, where the number of neurosurgeons per 100,000 inhabitants ranged from 0.45 to 2.94, with Germany shows the highest number.

German institutions of medical administration urgently need to consider regulation of neurosurgical specialist training to prevent a further uncontrolled increase in neurosurgeons in a manner that is not adapted to the needs of neurosurgical care for the German population. Actions might include a regulation of entry to the training and of the number of training sites. Furthermore, an integration of non-physician assistant health care professionals and delegation of non-surgical workload from neurosurgeons is necessary. A further increase in neurosurgeons would be associated with a decrease in the surgical caseload per surgeons during training and after board certification, which might compromise the quality of neurosurgical care [2].

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