

Strategy to increase Neurosurgery care capacity and Neurosurgery workforce in Low-and-Middle Income Countries

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Access to surgical care is disproportional around the world, and the inequity in neurosurgery is even more striking. It is estimated that 5 million essential neurosurgical cases go untreated yearly in low-and-middle-income countries (LMICs) [1, 2]. It is also estimated that 23000 additional neurosurgeons are needed to meet the current demand [2]. The needs are greatest in sub-Saharan Africa (SSA), Southeast Asia, and Latin America.

In 2016, the number of neurosurgeons in SSA, for example, was reported to be only 369, and the neurosurgeon-to-population ratio was 1 neurosurgeon for 2.5 million inhabitants [3]. This gap in neurosurgery care capacity can be closed only by educating and training additional neurosurgeons in LMICs.

Goal

In order to reach a satisfactory level of development in neurosurgery in SSA and Southeast Asia, the neurosurgeon-to-population ratio should at least match 1:500 000. Furthermore, the number of neurosurgeons in these areas should increase to reach a critical mass of neurosurgeons to speed up the process of increasing the neurosurgical care capacity.

Strategy

4 measures are to be taken:

- 1) Increase the capacity of training of the National training centers located in these areas
- 2) Increase the number of residents recruited in the World Federation of Neurosurgical Societies (WFNS) regional centers by selecting more candidates and offering additional WFNS scholarship for them
- 3) Increase the number of national training sites in LMICs by creating new or additional training centers
- 4) Increase the number of regional WFNS reference centers through a process of accreditation

In SSA, there are 23 national training centers and 4 WFNS regional training centers (Rabat, Alger, Dakar, Nairobi) established to educate African neurosurgeons from this region. The current

number of neurosurgeons is estimated to be around 450 neurosurgeons. It should be increased to reach 2500 neurosurgeons in the next 10 years, considering the evolution of the SSA population in the next decade. By reaching this number of neurosurgeons, we will be able to speed up the process of increasing neurosurgical capacity in an exponential way to close the gap in neurosurgery care capacity regionally.

The strategy consists of:

- Encourage all training program directors of the 23 national training centers to recruit 4 to 5 additional residents to be enrolled in the program each year in each center for 10 years
- Increase the number of selected residents for WFNS regional reference centers by 5-6 annually in Rabat Alger, Dakar, and Nairobi WFNS regional centers

In Morocco, 12 departments are currently participating in WFNS Rabat Training Center (in addition to 2 new departments that are expected to join the WFNS program soon), and each one can accept 4-5 new residents every year to be enrolled in the program. Thus, a total of 50 to 60 new residents can be enrolled in the WFNS Rabat Training Center program annually. From 2002 to date, 69 young African neurosurgeons were enrolled in the program in 17 SSA countries (3,4,5). Among them, 50 had already graduated. The application of this strategy would substantially increase the number of neurosurgeons in the next 10 years. We expect that the different national training centers will be able to train around 1400 new neurosurgeons, and the WFNS Regional centers will train around 400 neurosurgeons in the next 10 years. The creation of new national centers in the next years will increase the number of neurosurgeons by an additional 200 or more neurosurgeons. This strategy aims to train an additional 2000 neurosurgeons in the next 10 years, bringing the total number of neurosurgeons to around 2500 Neurosurgeons in SSA by 2032. This progression will dramatically reduce the gap in neurosurgery care capacity, and the neurosurgeon-to-population ratio is expected to match 1:500.000, assuming that population growth in SSA countries will reach 1.237 million inhabitants in 2030.

How to achieve this goal?

- This strategy calls for the participation and the coordination of all trainings centers and the commitment of training directors
- Support of the WFNS leadership and its foundation as well as the Sami 100 project provides sufficient scholarships
- Support of National neurosurgical societies as well as decision-makers and health managers in SSA country's governments
- Participation and support of international institutions and medical industry for financing this strategy

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