



Epilepsy in sub-Saharan Africa: is there anything neurologists could learn from HIV/AIDS health care?

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In Africa, 10 million people suffer from epilepsy and its mortality is three times higher than anywhere else [1]. Some of the causes are the following: demographic changes, the young age of the population, and HIV prevalence. Also, the shortage of neurologists there—about 1 in every 3–5 million people—makes the situation extremely difficult.

Malawi is a sub-Saharan African country with 18.5 million inhabitants and only two neurologists, while Italy has about one neurologist in every 5000 inhabitants. According to European standards, Malawi would need 3700 neurologists—certainly not only devoted to epilepsy. In how many years could Malawi, and sub-Saharan Africa (SSA) in general, solve such shortage of neurologists?

The Italian academic system offers 215 new accesses per year [2] to doctors willing to become adult or pediatric neurologists. Even if Malawi could benefit from a similar system,

30 years would not be sufficient to fill the gap, also because the population will increase according to its fertility rate (\approx 38 millions).

Limited resources are another obstacle to build a cadre of neurologists there. State schools in Italy invest more than 160,000€ to graduate one student in 20 years [3]. Malawi invests more than 6% of its GDP in school and education; accordingly, it could spend 930€ to graduate one student in 20 years [4]. Shortage of neurologists in Malawi and in SSA in general cannot be solved in a short-middle term.

Which future is there for the treatment of epilepsy in Malawi and SSA?

The results achieved during the last 20 years in Africa in HIV/AIDS management offer hints for solutions that could be useful also for epilepsy.

At the beginning of this century, triple therapy was the recognized effective antiretroviral treatment against HIV commonly used in Western countries; however, this was not the case in Africa. In 2005, 11.7–17.1% of the population in Malawi was HIV+ but only 3.1% had access to the antiretroviral treatment. In 2000s guidelines to treat HIV/AIDS in Africa, the antiretroviral treatment to HIV+ patients was limited to those in an advanced stage of disease (Table 1). Guidelines in Malawi and in Africa have recently been changed and a “test and treat” approach has been adopted, just like in Western countries. This has greatly contributed to improve the access to treatment and nowadays 84.1% of the HIV+ patients receive the triple therapy; HIV+ mothers can give birth to children free from the virus and can breastfeed, thus sharply reducing mother-child mortality rate [5]. In the last 20 years, the history of HIV/AIDS in SSA has deeply changed.

Examining how these changes took place in SSA could offer suggestions to neurologists interested to scale up programs to fight epilepsy there.

HIV/AIDS treatment programs in SSA mainly occur in primary health care centers, which are sometimes located far from city hospitals in order to offer treatment also to rural

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Table 1 The future of epilepsy in sub-Saharan Africa and the case of Malawi: lessons from HIV

	HIV		Epilepsy	
	2005	2019	2019	2032
Prevalence	11.7–17.1%	9.2%	2.8 [§] –5.2% [#]	?
Treatment gap	96.9%	16%	> 70%	?
Expenditure to cover cost of treatment per patient/year	700€*	200€	USA: 2051–11,354\$ (2013)** Sub-Saharan Africa: 0.36–1.06\$Int (2005) [†]	?
Treatment guidelines	Clinical stage 3, 4, or CD4 < 250	Test and treat	2–4 drugs (often out of stock)	?

*Costs are inclusive of visits and consultations, viral load detection and blood examinations, drugs, costs of the DREAM personnel (doctors, clinical officers, nurses, technicians, pharmacists, managers, biologists, cleaners, etc.), etc.

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population (> 60% in SSA; > 83% in Malawi). In those centers, health care is frequently managed by clinical officers: non-medical doctor health workers. Results in HIV/AIDS treatment have been obtained thanks to continuous education and training of such health personnel, the adoption of effective treatment protocols (triple therapy and viral load monitoring), and the involvement of local communities to enhance adherence and retention.

Epileptic patients seem to face similar problems as those of HIV+ patients years ago in SSA: poor access to treatment (the treatment gap for epilepsy is more than 70%), poor education and training of health workers, shortage of specialized doctors, frequent breaks in drug distribution, limited resources, cultural barriers, isolation, and stigma [1]. Recently, the United Nations confirmed that more than half of the world population lacks access to primary care, and this greatly affects Africa also in the care of epilepsy. There are excellent centers for epilepsy in Africa but they are few and often inside city hospitals, far from rural areas; a percentage of patients cannot afford drugs, visits, and examinations as electroencephalography.

Due to the alarming increase of the double burden of HIV/AIDS and non-communicable diseases—including epilepsy—the United Nations have given indications to unify treatment of HIV/AIDS and non-communicable diseases in HIV/AIDS centers. Is it possible to scale up the management of epilepsy in those centers? Can we expect the same good results as those observed for HIV/AIDS?

Health workers in HIV/AIDS need adequate education and training on epilepsy. This must be tailored according to their needs. Education models adopted for doctors and residents in Western countries may not reach the same goal in those

settings. Duration of education and training is an issue. In Western countries, it takes 10 years to become a neurologist (to graduate and complete studies as resident); how long should an education and training course on epilepsy for clinical officers in SSA countries last?

Due to many limitations, the usual duration of these courses in SSA goes from days to weeks. The efficacy of such short-lasting approach is uncertain. Long-lasting programs could reach the goal better, also by increasing knowledge and relationship among teachers and local health workers.

Managing epilepsy in HIV/AIDS centers helps hospitals to reduce work overload and redistribute the inadequate resources: health expenditure of SSA countries is 29USD per capita/year (1.5% GDP); in Western countries, it is 4700USD (9% GDP).

Non-governmental organizations (NGOs) offer active support to national health systems in SSA also thanks to their long-lasting activities in those areas. NGOs can offer networking capability, tailored education and training programs, and may enhance communication between local health workers and doctor specialists from Western countries. Partnership between NGOs and Western academics may play an increasing role in scaling up health programs for NCDs in SSA. It is in the authors' experience that this is true also for epilepsy [5].

The Disease Relief through Excellent and Advanced Means (DREAM) is a public health program started in 2002 by the Community of Sant'Egidio, active in 11 SSA countries, offering free health services in 49 HIV/AIDS health centers [5]. In DREAM, more than 500,000 HIV+ patients are regularly followed, and this includes viral load monitoring; clinical activities are supported by 25 laboratories where novel diagnostic cost-effective methods have been developed. All DREAM

personnel are local, regularly updated thanks to teaching courses from European specialists. Only 1.3% of patients per year are lost to follow-up. More than 100,000 children are born HIV free from HIV+ mothers with a sharp reduction of mortality [5].

The persistence of HIV in the body increases the risk of epilepsy and other NCDs as arterial hypertension, diabetes, stroke, ischemic heart disease, and cancer—all main causes of death in SSA. The DREAM Program is scaling up health programs to manage these chronic diseases [5]. A dedicated telemedicine service offers thousands of teleconsultations per year to support local activities and to bring European specialists where there are no specialists [5].

In this scenario, the Italian Society of Neurology promoted a partnership with the DREAM Program in SSA to start an epilepsy program at the DREAM center in Blantyre, Malawi. The DREAM center has been active for 15 years and thousands of HIV+ patients are regularly visited there. A DREAM doctor from Blantyre has recently spent an education and training period at the Foundation of the C. Besta Neurologic Institute in Milan and is now treating epileptic patients in Blantyre. Difficult cases are discussed remotely also thanks to the telemedicine platform. Transmission of video EEG investigations will start soon. Thanks to such a partnership model, an epilepsy center is active at Maputo Central Hospital, Maputo, Mozambique, and follows thousands of children. Hopefully, similar results will be obtained in Malawi.

Pablos-Mendez and Shademani reported that “A shift from ‘focusing’ on evidence to solving problems is overdue” and also added the quote by Herbert Spencer: “The great aim of education is not knowledge but action.”

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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