



**Understanding and managing stroke**  
**From the neuron to the community :**  
**Panoramic approach of the patient**

**Pr Amadou Gallo DIOP**, MD, PhD  
*Head Dpt of Neurosciences, University of Dakar, Senegal*

RTC, Dar es Salam, Oct. 28<sup>th</sup>, 2023



no commercial  
relationships or off-label  
content to disclose

- ◆ Pain
- ◆ Epilepsy
- ◆ Isch/Hem **Stroke**
- ◆ Meningo-Encephalitis
- ◆ Peripheral Neuropathies
- ◆ Malnutrition Neuro-Myelopathies
- ◆ Post Medullar & Cranial Traumatism
- ◆ Parkinson, Alzheimer and other Dementias
- ◆ Consanguineous Neuro-Degenerative Disorders

# EAN-WFN TCs Topics

## ✓ 2008

- Peripheral neuropathies
- Neurodegenerative disorders

## ✓ 2009

- **Stroke**
- Epilepsy

## ✓ 2010

- Infectious diseases
- Dementias

## ✓ 2011

- Spinal cord pathologies
- **Stroke**

## ✓ 2012

- Communicable and metabolic neurological disorders during childhood
- Neuro-epidemiology and SSA

## ✓ 2013

- **Stroke**
- Movement disorders

## ✓ 2014

- Peripheral nerve and muscle
- CNS infections

## ➤ 2015

- **Stroke**
- Ischemic stroke in children

## ✓ 2016

- **Stroke**
- Epilepsy
- Neuro-HIV

## ✓ 2017

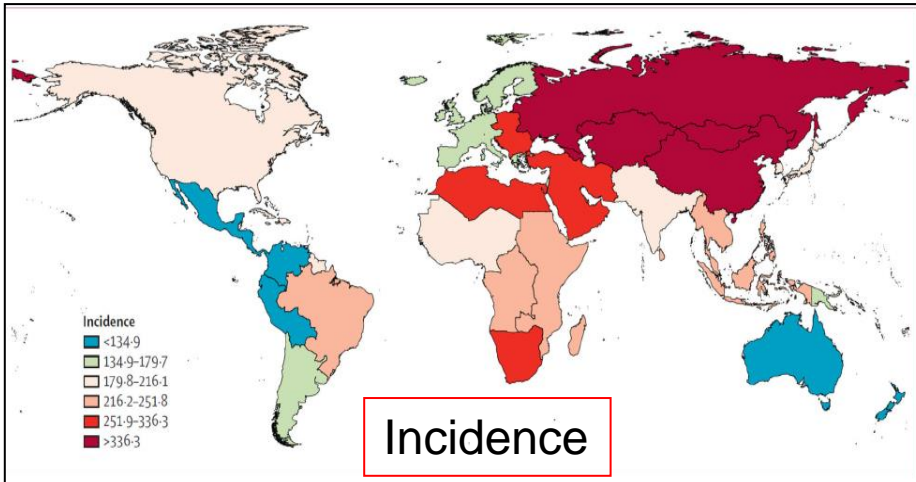
- **Stroke**
- Movement disorders
- Dementia
- Spine
- Neuro-Muscular

## ✓ 2018

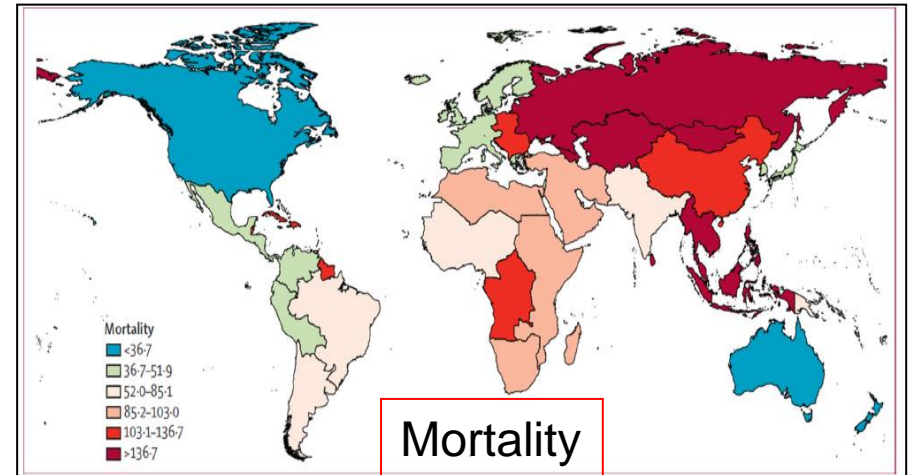
- **Stroke**
- Epilepsy
- Movement disorders
- Neurodegeneration
- Infection / Inflammation

## ✓ 2019

- Peripheral
- Myopathies
- Neuro-Infections
- Neurophysio
- Headache



*Feigin et al, Lancet 2014*



## In AFRICA

- ✓ Incidence: 15 – 148 per 100,000
- ✓ Prevalence: 15 – 468 per 100,000
- ✓ Mortality: 82 – 165 per 100,000



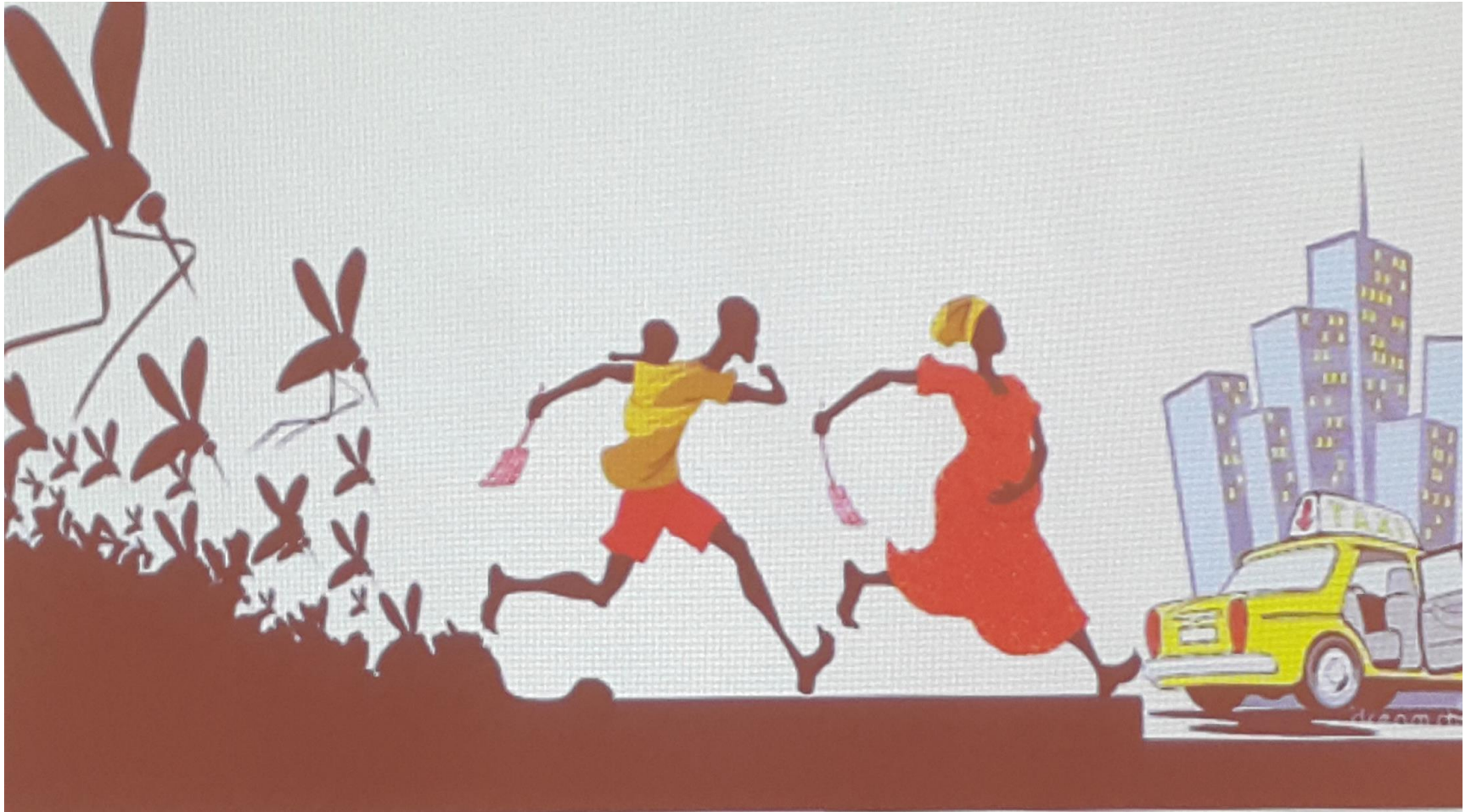
expected incidences of Stroke in 2050

# Why incidence of NCD is increasing in developing countries, especially in Africa?

- ✓ Increased Life-expectancy ?
- ✓ Transmitted-diseases are decreasing and/or better

Diagnosis of NCDs ?

- ✓ Increasing vascular risk factors ? and neglected ?
- ✓ What about the management?



From **RURAL** to ...”**RURBAN**” life style

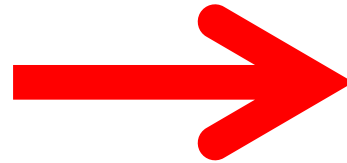


## Rural Population

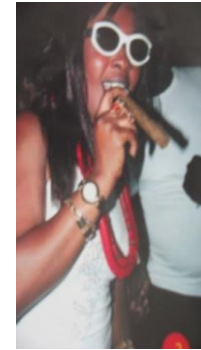


## URBANISATION

- Bad & fast food
- Salty
- Tobacco
- Poor Economy
- Less physical activities



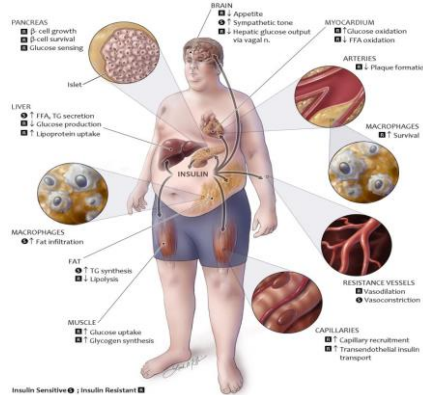
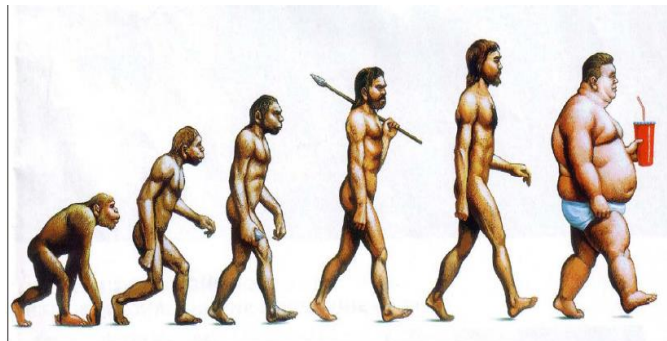
## Urban Population



- HTA
- Obesity
- Cardiopathy
- Diabetes
- Kidney failures
- Hypercholesterolemia
- + HIV & other inf°



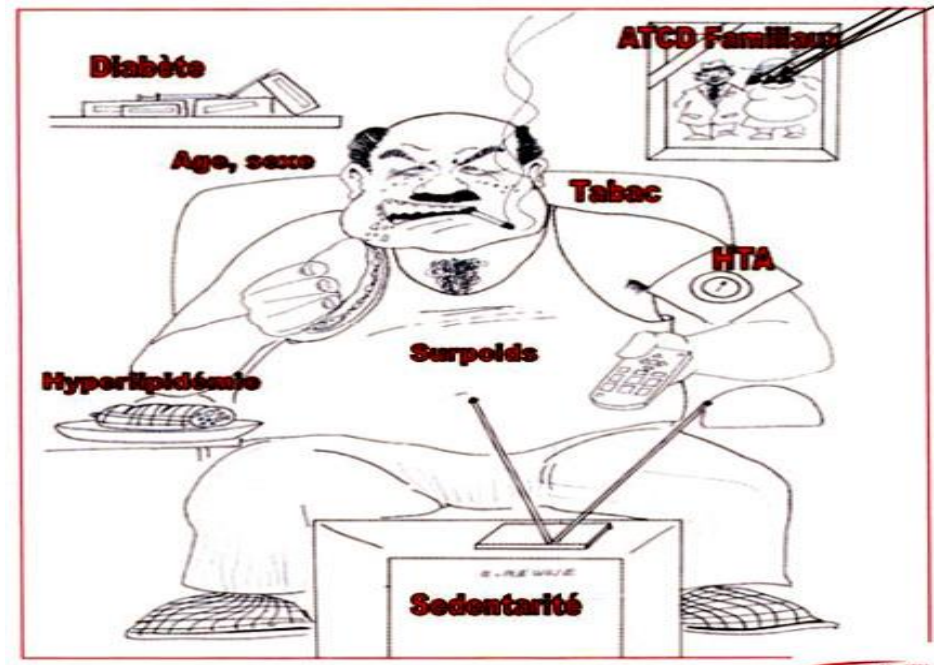
**+ Cultures  
+ Education  
+ Industries**



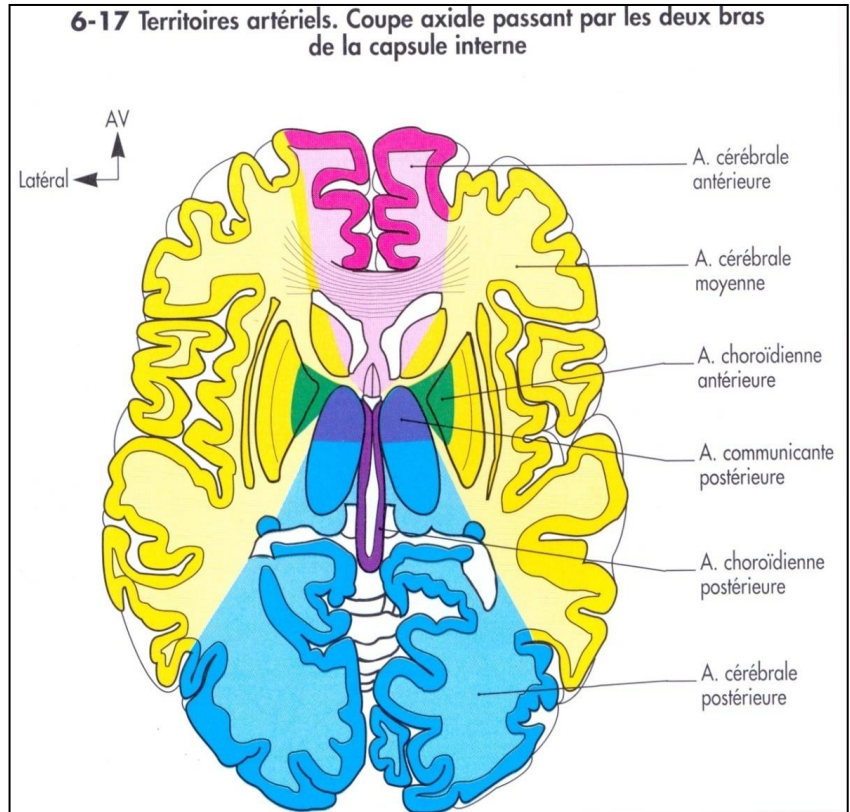
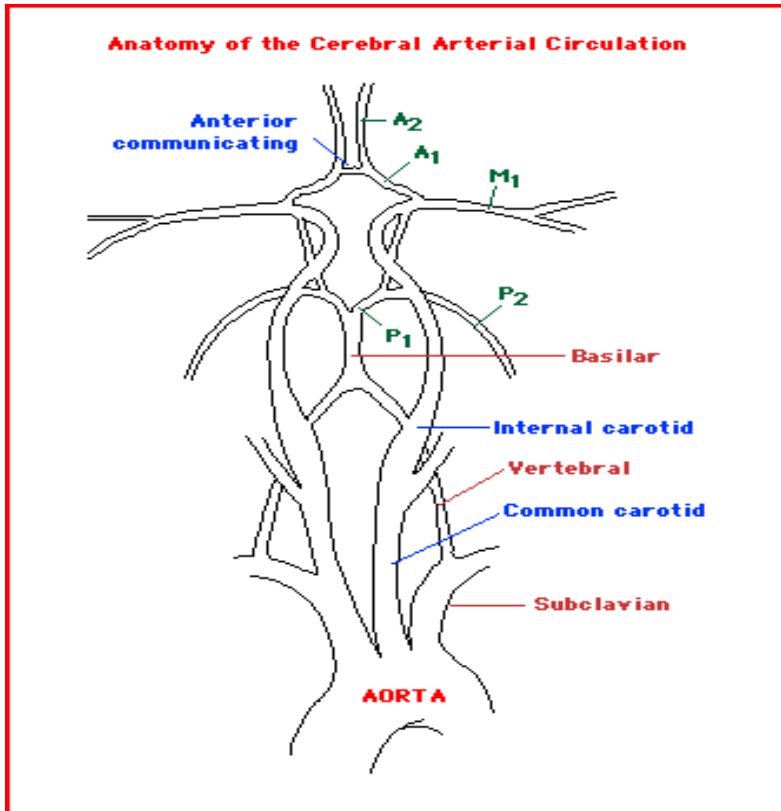
- **Obesity**
- **Diabetes**
- **Cardiovascular Diseases**
- **Kidney impacts**
- **Cancers**

# INCREASED RISK FACTORS

- **HTA**
- **Diabetes**
- **Hypercholestérolémie**
- **Tobacco**
- **Alcohol**
- **Obesity**
- **Post-Infections**
- **Sickle-Cell disease**
- **Art-Ven. Malformations**



# PATHOPHYSIOLOGY



**Whatever the cause,  
when a group of neurons is, directly or indirectly stressed**

**Necrosis**

**Apoptosis**

**Disturbance**

**Death**

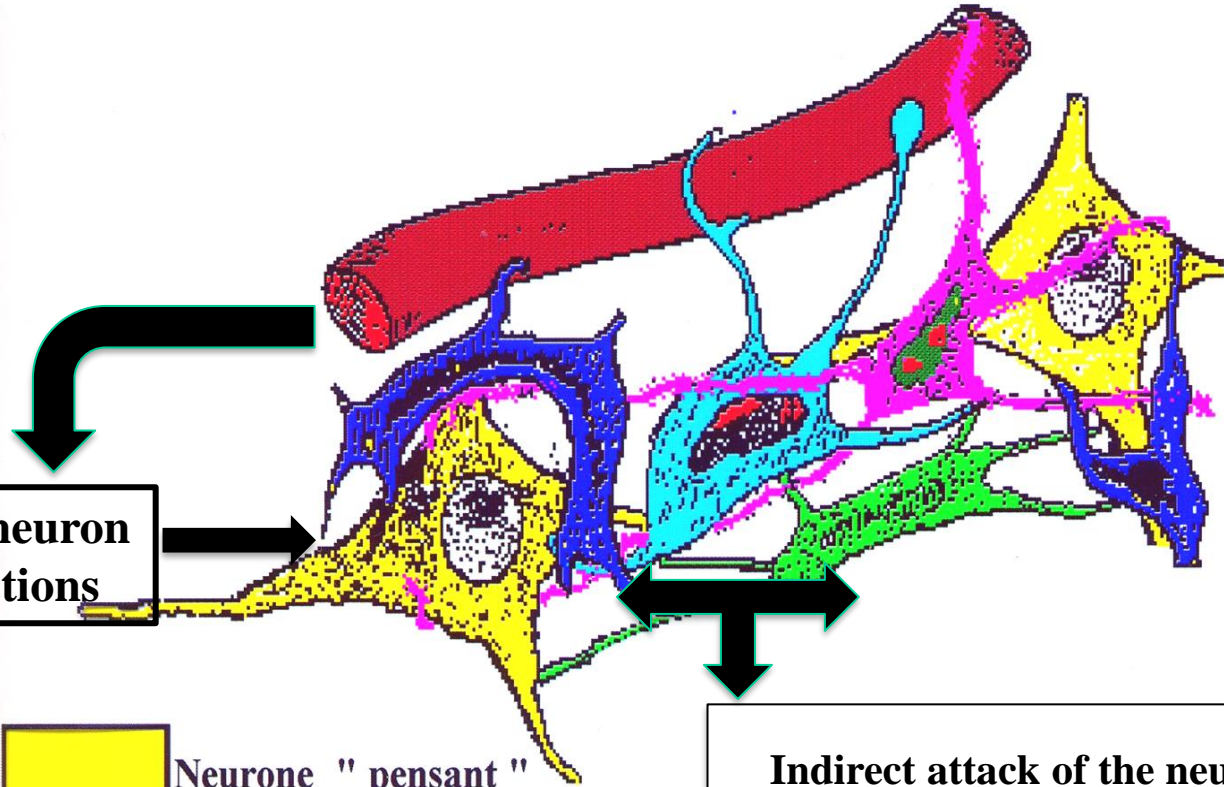
*irreversible*

*reversible*

**→ Loss / Reduction  
of function(s)**


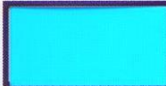


**Hyperexcitability.  
→ exaggeration;  
if synchronized  
→ Seizure**

# Neuron & its environment



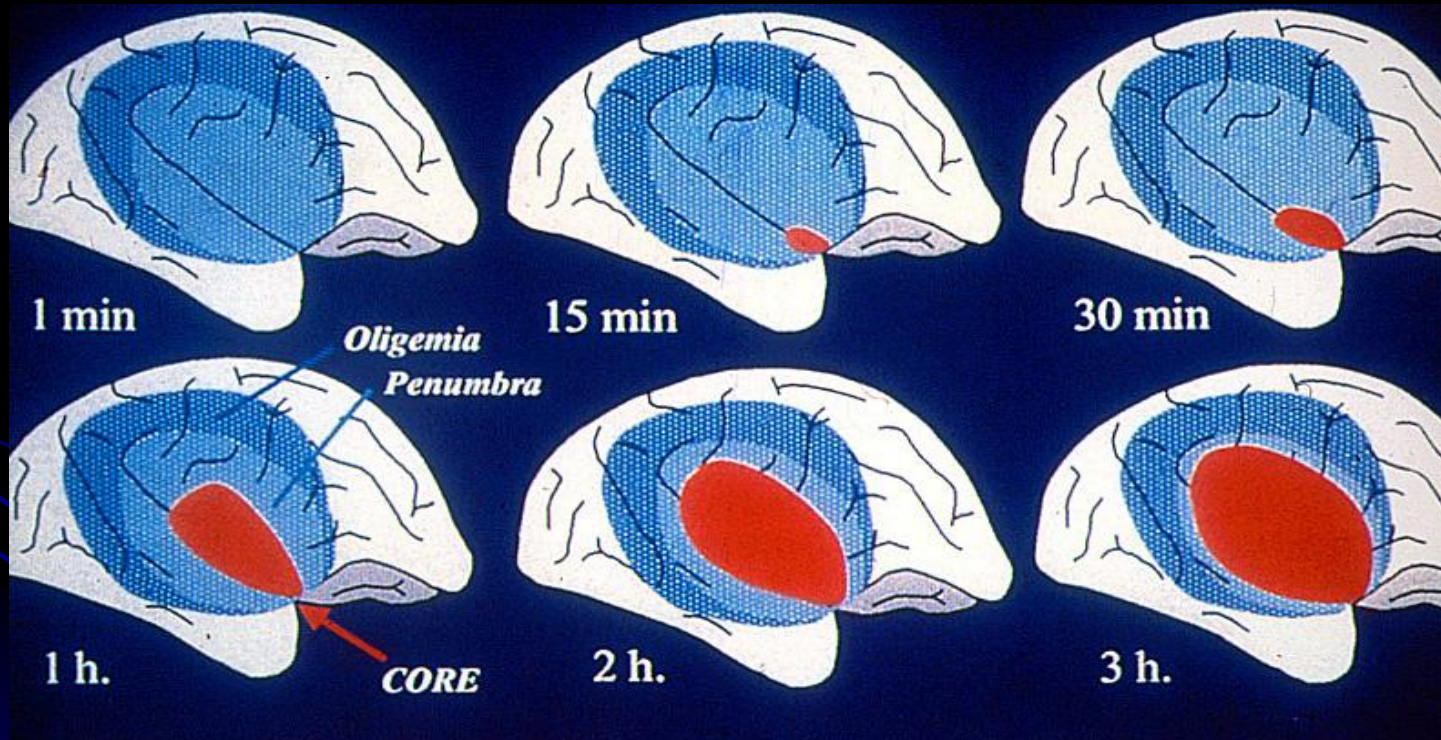
**Direct attack of the neuron and consecutive reactions**

**Indirect attack of the neuron via microcytes and astrocytes and consecutive neuronal reactions**

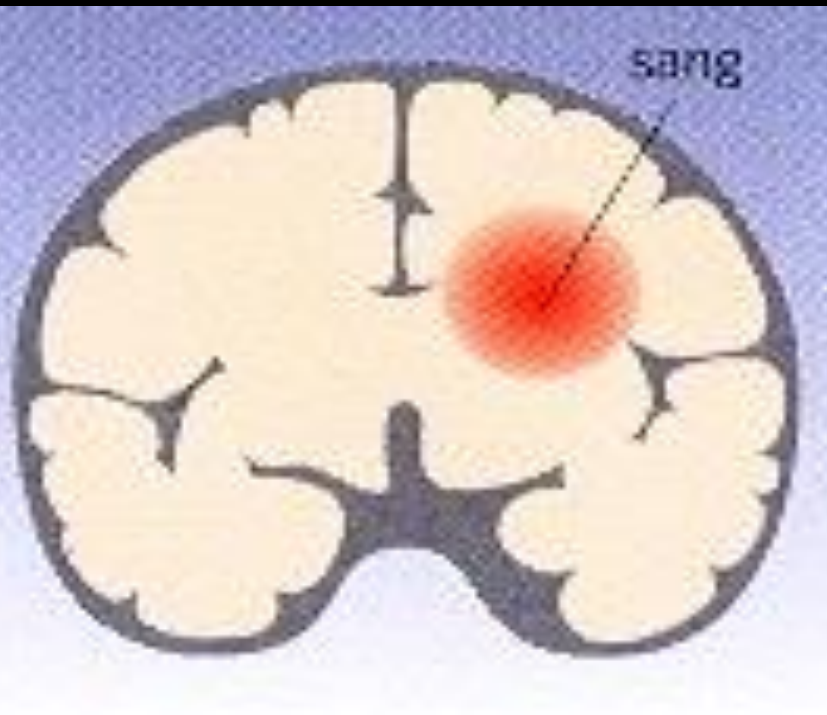
-  Neurone " pensant "
-  Astrocyte " intendant "
-  Astrocyte " pipelette "
-  Astrocyte " entretien "

 Cellules " Sécurité "

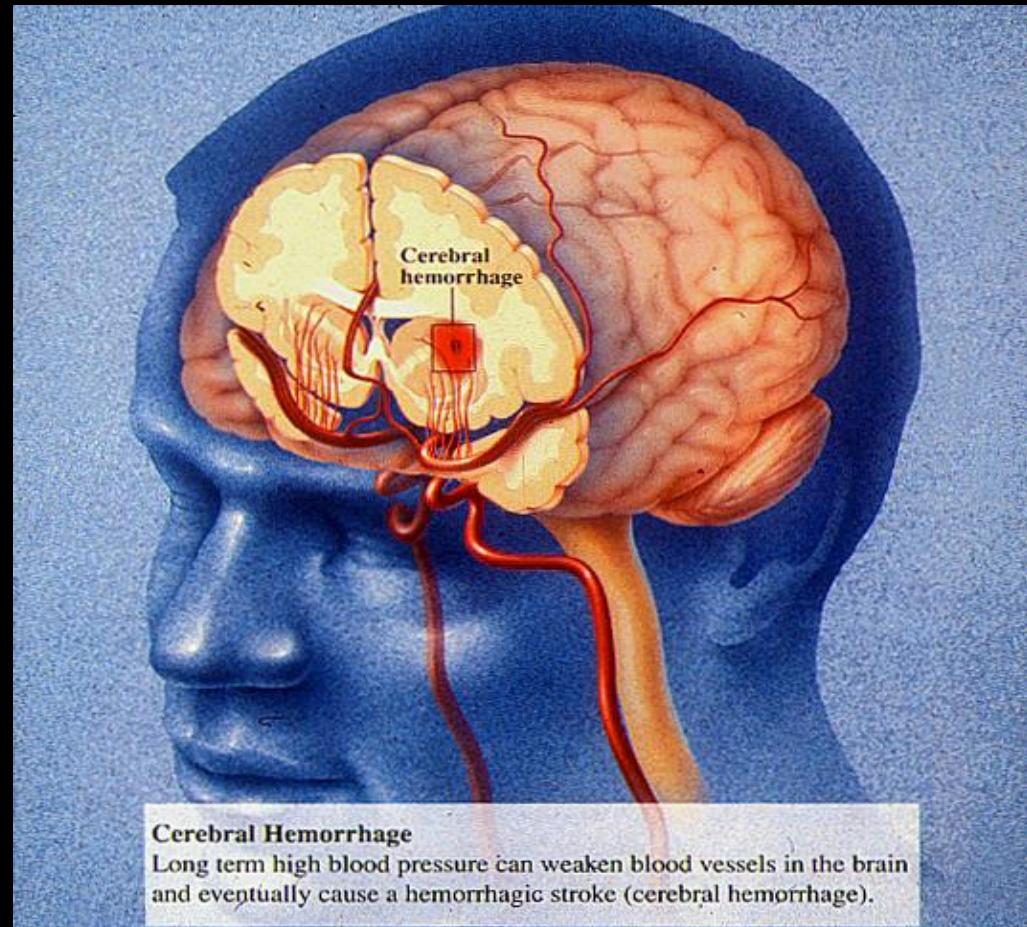
# EVOLUTION OF ISCHEMIC PROCESS



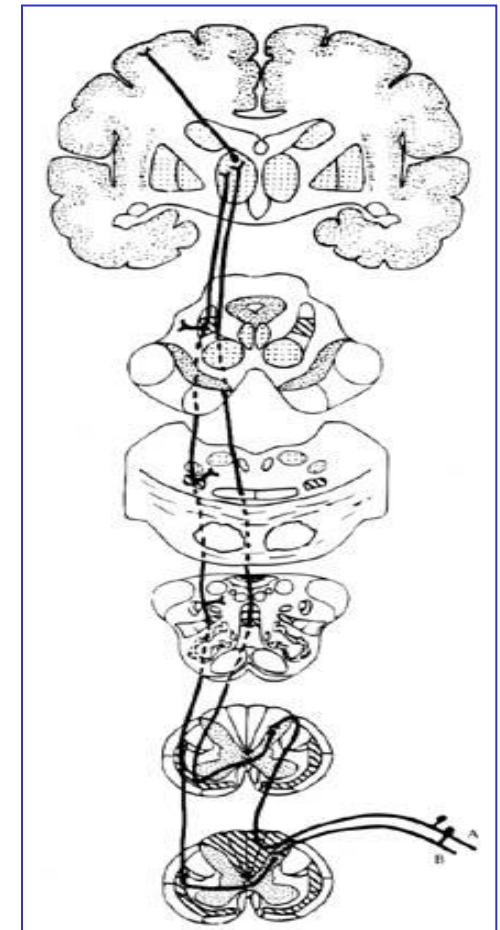
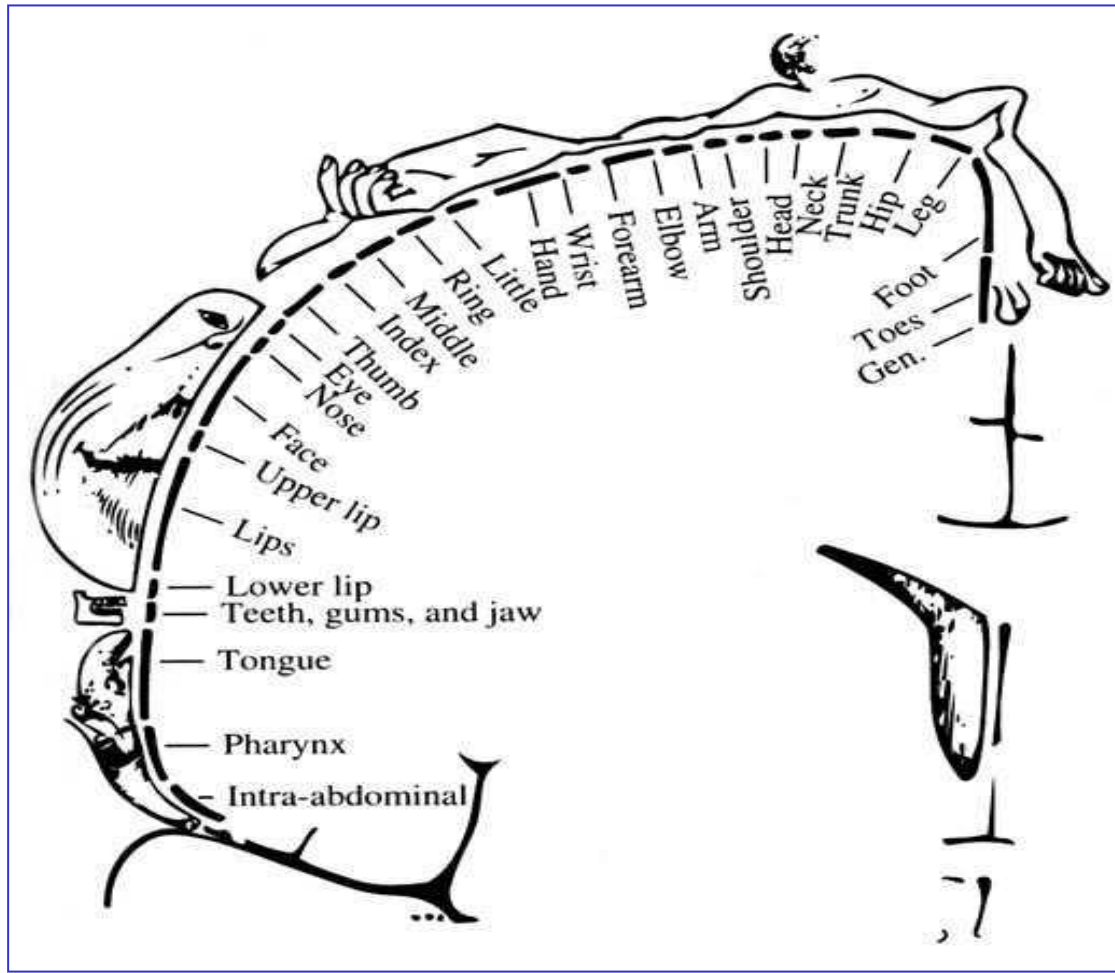
# AVCH



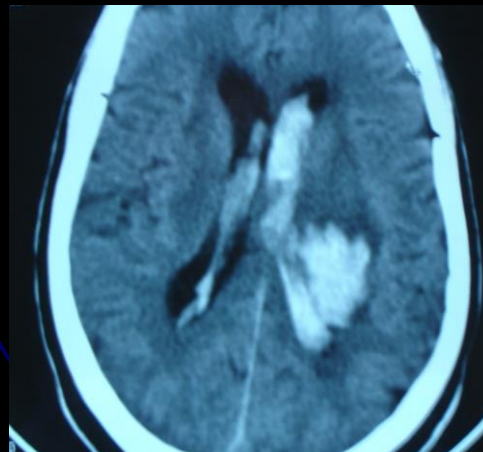
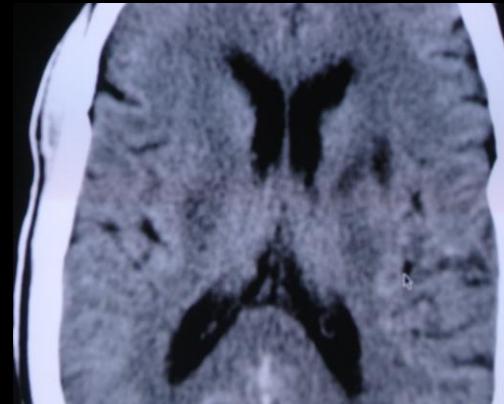
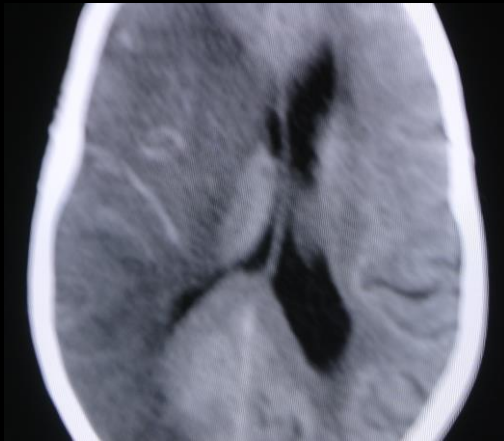
**HEMATOME CEREBRAL**







# NEUROIMAGING SEMIOLOGY



# ***Our main challenges in Africa***

## **THE FACTS**

- ✓ Increasing incidence and prevalence, in generally poor-setting
- ✓ Weak Management of stroke emergencies
- ✓ Heavy burden of post-stroke

## **THE NEEDED ACTS**

- Education about risk factors ; youth, women
- Mobile and fixed Emergency & Stroke Units
- Neurosciences facilities and trained Staff

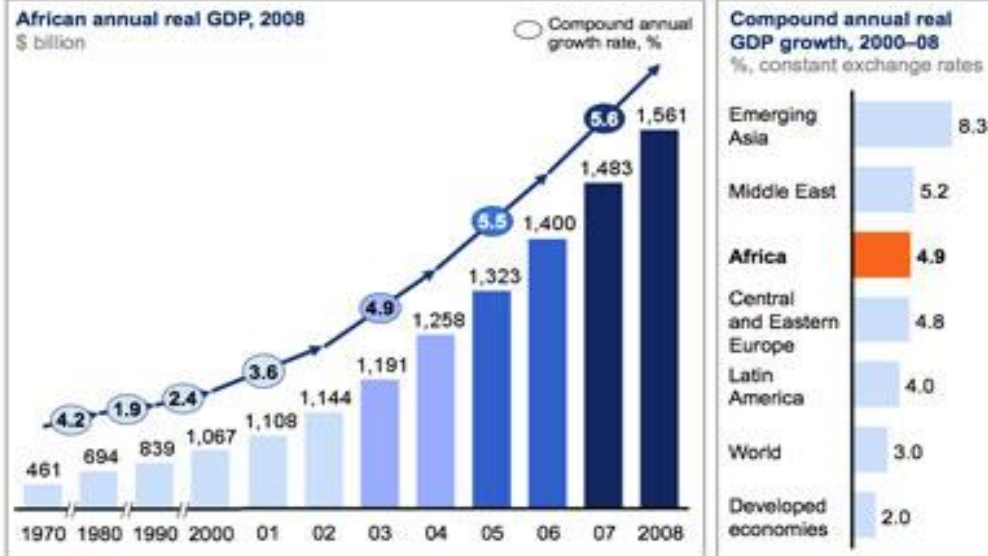
# How can we improve the situation IN SUB-SAHARAN AFRICA ?

- **Communication**
- **Training+++**
- **Care**
- **Equipment**
- **Cooperation**
- **Research**

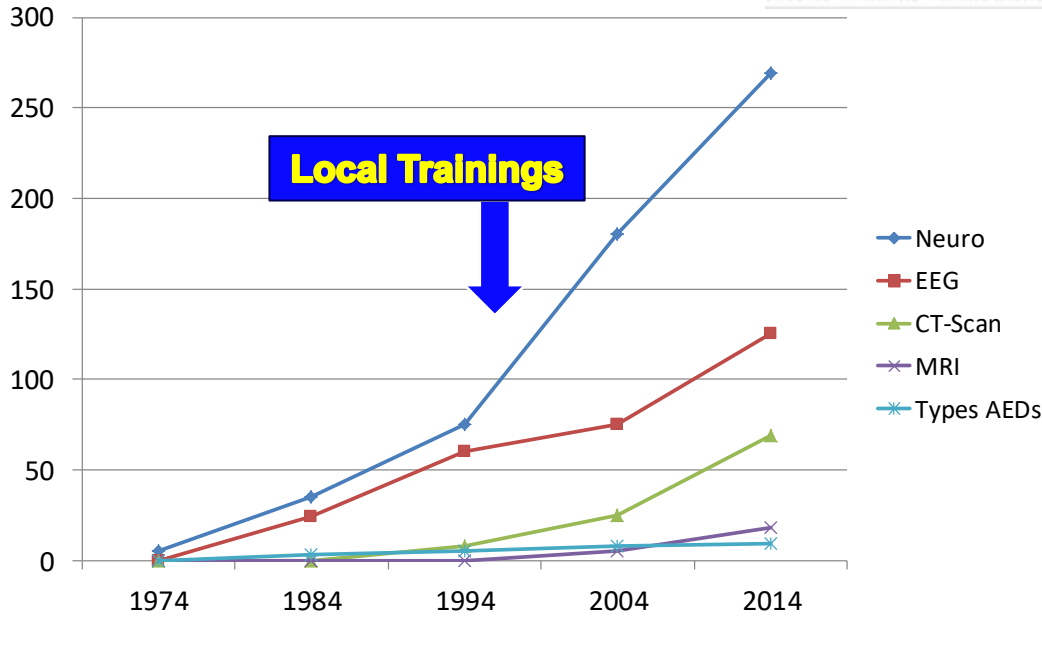


**When general situation improves...**

**Africa's economic growth accelerated after 2000, making it the world's third-fastest growing region**



SOURCE: International Monetary Fund; World Bank World Development Indicators; McKinsey Global Institute



Courtesy from Pr. E. Perucca

**“Neuro-Condition” improves...**



**Modern medicine**

**Traditional Medicine**

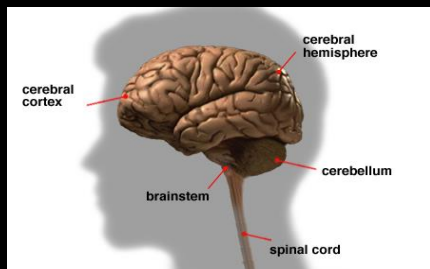
*We must not oppose them;  
How to deal with it & "capture" people  
with the disease so that they can benefit  
from modern medicine?  
need to open to socio-cultural  
stakeholders*

# COMMUNICATION +++

- TV
- Radio
- Documentary
- Testimonials : patient, parent,
- Primary school teachers
- Slogans by V.I.P / Celebrities
- Radio/TV announcements

# VERY EARLY EDUCATION

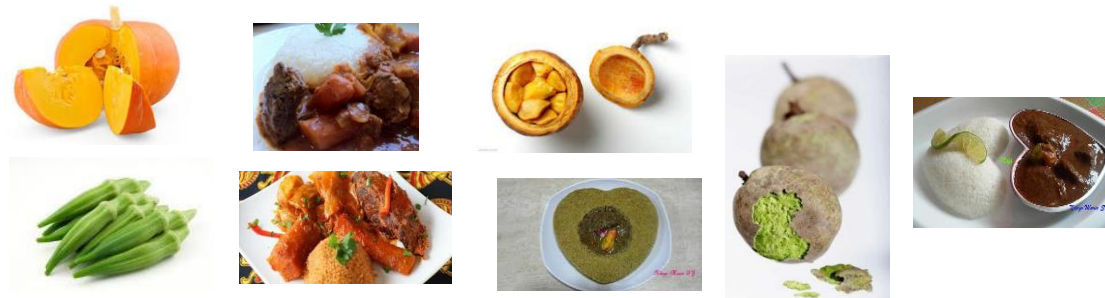
## Place, role and responsibilities of WOMEN?





## 6 Families of nutrients

- ✓ Fruits & legumes
- ✓ Cereals
- ✓ Fish, Meats, Egg, Poultry
- ✓ Moderate lipid
- ✓ Milk and derived pdts
- ✓ Water





### Drive engagement of civil society '

- Volunteers
- Clubs
- Parents
- Media



## **Public Health Intervention**

*“Neuro-Caravans for Epilepsy & Stroke”..*

- **Training of physicians and other healthcare professionals**
- ➤ **Women, Primary School Teachers , Traditional Healers**
- ➤ **Media**
- ➤ **Consultations + portable EEG portable**



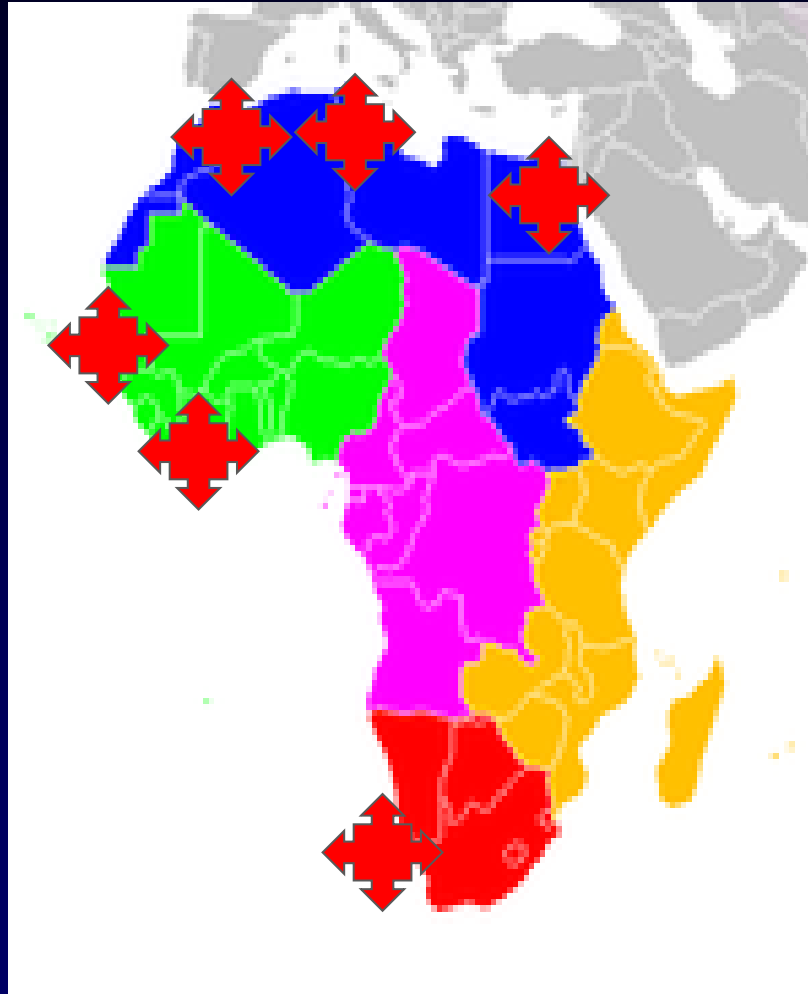
Reach out to the populations. Collaborating with the key health and community stakeholder



# Trainings in Neurology in Africa

Since 60 to 25 years:

- Cote d'Ivoire
- Egypt
- Morocco
- Senegal
- South Africa
- Tunisia
- + much more,  
recently





**Mexico**

**Rabat**

**Cairo**

**Dakar**



Promoting global neurological education and training



# The African Academy of Neurology (AFAN)



VOL. 30 - NO. 5 - October 2015

## WORLD NEUROLOGY

THE OFFICIAL NEWSLETTER OF THE WORLD FEDERATION OF NEUROLOGY

### AFAN Brings New Era in African Neurology

**BY RAAD SHAKIR**

It was a momentous day in the history of African neurology. For more than 40 years, the continental neuroscience organization was an amalgamation of neurologists and neurosurgeons. The Pan African Association of Neurological Sciences (PAANS) served its purpose, and it has been time for the establishment of an organization dedicated to neurology. Neurosurgeons already have established the Continental Association of African Neurosurgical Societies and held an inaugural meeting in Algiers.



Raad Shakir



Representatives from 27 countries participate in the inaugural meeting of the African Academy of Neurology in Dakar, Senegal, in August.

The World Federation of Neurology (WFN) fully supported the views of neurologists in Africa to establish the association. This followed many years of discussion and consultation, ever since the establishment of the Task Force for Africa in 2006 during the presidency of Jules Koffi and the subsequent multi-ethnic meeting in Johannesburg, South Africa, in 2008. The WFN organized a World of Neurology in Dakar for the 40th World Congress for African Neurology. One of the final views

### Dementia: A New Perspective

A dementia-free population, one where everyone can be regarded as an individual of the highest and most advanced intelligence.

Dementia is the loss of brain capacity or memory to result in the loss of self-identity. The incidence of dementia, which is rising globally, is largely driven by the aging population. Although dementia increases with age, it is not inevitable with age. Dementia is

not a normal stage of aging process, for which there are reliable and preventable interventions.

Brain blood vessels (arteries) and Alzheimer's disease represent the two main causes of dementia leading to dementia. The changes of Alzheimer's disease are characterized by the deposition of amyloid protein plaques and neurofibrillary tangles in the brain. The changes in the brain of Alzheimer's disease



Raad Shakir

#### INSIDE

From the Editor-in-Chief: Implementing a new system with

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released to gather delegates from as many African neurological societies as possible to hold an inaugural extraordinary meeting in Dakar, Senegal, in August. This was arranged by Prof. Gallo Diop, WFN trustee and chair of the WFN Africa initiative, and Prof. Riadh Gouider, WFN trustee and

sia, Uganda and Zambia. The bylaws and constitution, which were drafted by Prof. Mostafa Elaloui, Morocco, were circulated in advance. After careful review, the draft unanimously was approved. The following day and according to the

# The Sole Regional Representative in the WFN of the interests of Neurology in Africa

## Created: 30 August 2015 Dakar, Senegal

# AFRICAN ACADEMY OF NEUROLOGY (AFAN)



**MEMBER COUNTRIES** (National Neurologic societies, with WFN)

- Algeria
- Burkina Faso
- Cameroon
- Congo, Democratic Republic of
- Cote d'Ivoire
- Egypt
- Ethiopia
- Gabon
- Guinea, Republic of
- Kenya
- Libya
- Morocco
- Nigeria
- Senegal
- South Africa
- Sudan
- Tanzania
- Tunisia
- Uganda
- Zambia

**MEMBER COUNTRIES ( w/o National Neurologic societies – in process of registration)**

- Angola
- Benin
- Congo Brazzaville
- Ghana
- Guinee
- Madagascar
- Mali
- Mauritanie
- Niger
- Rwanda
- Togo







WFN Department Visit Programmes give the opportunity to young neurologists from Africa or Central and South America to visit the Neurological Departments of another institution outside of their home country for 4 to 6 weeks.



Top (from L - R) Mr. Burak Tokdemir from the Turkish Neurological Society, Dr Atoké Mendinatou Agbetou from Benin, and Dr Maouly Fall from Senegal. Bottom Left (from L - R) Kalpesh Deraji Jivan, MD, Bettina Pfausler, MD, and Raimund Helbok, MD at the Innsbruck Medical University Bottom Right (from L - R) Dr Marieme Diop and Dr Yohannes Debebe at the Nobel Prize Center in Oslo, Norway



WFN Department Visits

COMING SOON > France and Mexico department visits.

In partnership with the Austrian Neurological Society, Austria 2015, 2017



**Hanna Demissie Belay**, Ethiopia  
Medical University of Vienna, 2015



**Kalpesh Deraji Jivan**, South Africa  
Innsbruck Medical University, 2015



**Ahmed Elkady**, Egypt  
Medical University of Vienna, 2017



**Mohammed Rabie**, Egypt  
Medical University of Graz, 2017



**Biniyam Ayele**, Ethiopia  
Innsbruck Medical University, 2017

In partnership with Norwegian Society of Neurology in November 2016



**Izanne Roos**, South Africa  
University of Bergen, 2016



**Yared Zenebe**, Ethiopia  
University of Bergen, 2016



**Marieme Soda Diop-Séne**, Senegal  
University of Oslo, 2016



**Yohannes Debebe**, Ethiopia  
University of Oslo, 2016

In partnership with Turkish Neurological Society in 2012, 2013, 2016 and 2017



**Philip Babatunde Adebayo**, Nigeria  
Istanbul University Cerrahpasa  
Turkey, 2012



**Dr Mehila Zebenigus**, Ethiopia  
Hacettepe University  
Turkey, 2012



**Dr Obiabo Yahaya Olugbo**, Nigeria  
Istanbul University  
Cerrahpasa Turkey, 2013



**Abdullahi Ibrahim**, Nigeria  
Gazi University of Ankara



**Maouly Fall**, Senegal  
Gazi University of Ankara  
Turkey, 2016



**Atoké Mendinatou Agbetou**,  
Houessou, Benin Istanbul University  
Cerrahpasa Turkey, 2016



**Leonard Ngarka**, Cameroon  
Selcuk University  
Turkey, 2017

In partnership with the Canadian Neurological Society, Canada 2017



**Giordani Passos**, Brazil  
Montreal Neurological Institute



**Vanessa Benjumea-Cuarteras**, Argentina  
Montreal Neurological Institute

WFN Teaching Centers in Africa:

Rabat (Morocco) - 1 year fellowship electrophysiology  
Completed by: **Alassane Drave, Burkina Faso,**  
**Boubacar Maiga, Mali**

Cairo (Egypt) - 1 year fellowship

Dakar (Senegal) - full training and 1 year fellowship epilepsy

WFN Teaching Centers in America:

Mexico - 1 year fellowship

In partnership with German Society of Neurology in October 2016, 2017



**Samy Mohamed Lemine Daddah**,  
Mauritania University Hospital of Ulm  
Germany, 2016



**Ahmed Abualhasan**, Egypt  
University of Bochum, 2016



**Aminou Tassiou Nana Rahamatou**, Niger  
Neurological Department of the  
University Hospital in Cologne, 2017



**Martin Kaddumukasa**, Uganda  
St. Josef Hospital in Bochum (University  
Clinic of the Ruhr University) 2017

In partnership with the Italian Neurological Society, Italy 2017



**Adefemi A Daniel**, Nigeria  
2017

Special thanks to all the WFN members and trusted partners

