Neurological disorders are the leading cause of disability and the second leading cause of death worldwide (Lancet 2016)
The bulk of the burden is in low-income and middle-income countries (Lancet 2016)
Epilepsy: a public health imperative!

Ranking of age-standardised DALY rates for all neurological disorders by region, 2016
DALY=disability-adjusted life-year (Lancet 2016)

| Disorder                          | Global | East Asia | Southeast Asia | Oceania | Central Asia | Central Europe | Eastern Europe | High-income Asia Pacific | Australia | Western Europe | Southern Latin America | High-income North America | Caribbean | Andean Latin America | Central Latin America | Tropical Latin America | North Africa and Middle East | South Asia | Central sub-Saharan Africa | Eastern sub-Saharan Africa | Southern sub-Saharan Africa | Western sub-Saharan Africa |
|----------------------------------|--------|-----------|----------------|---------|--------------|----------------|----------------|------------------------|-----------|----------------|------------------------|--------------------------|-----------|----------------------|------------------------|------------------------|-----------------------|----------------------|
| Stroke                           | 1      | 1         | 1              | 1       | 1            | 1              | 1              | 2                      | 1         | 1              | 1                      | 1                        | 1         | 1                    | 1                      | 1                      | 1                     | 1                    |
| Migraine                         | 2      | 3         | 3              | 2       | 2            | 2              | 2              | 1                      | 2         | 2              | 1                      | 1                        | 1         | 1                    | 1                      | 1                      | 1                     | 1                    |
| Alzheimer’s disease and dementias| 3      | 2         | 2              | 3       | 4            | 3              | 3              | 3                      | 3         | 3              | 3                      | 3                        | 3         | 4                    | 3                      | 4                      | 4                     | 4                    |
| Meningitis                       | 4      | 11        | 5              | 4       | 9            | 12             | 10             | 14                     | 13        | 13             | 11                     | 11                       | 10        | 8                    | 5                      | 3                      | 2                     | 2                    |
| Epilepsy                         | 5      | 5         | 4              | 5       | 3            | 7              | 8              | 6                      | 7         | 6              | 5                      | 5                        | 4         | 6                    | 5                      | 2                     | 5                     | 2                    |
| Spinal cord injury               | 6      | 7         | 8              | 9       | 7            | 6              | 5              | 4                      | 4         | 4              | 4                      | 4                        | 4         | 4                    | 4                      | 4                     | 4                     | 4                    |
| Traumatic brain injury           | 7      | 6         | 7              | 6       | 5            | 4              | 4              | 4                      | 4         | 4              | 4                      | 4                        | 4         | 4                    | 4                      | 4                     | 4                     | 4                    |
| Brain and other CNS cancer       | 8      | 8         | 9              | 10      | 6            | 7              | 5              | 8                      | 6         | 7              | 5                      | 8                        | 10        | 9                    | 7                      | 7                     | 8                     | 7                    |
| Tension-type headache            | 9      | 8         | 10             | 8       | 10           | 8              | 7              | 6                      | 7         | 7              | 6                      | 7                        | 8         | 8                    | 7                      | 7                     | 7                     | 6                    |
| Encephalitis                     | 10     | 11        | 7              | 6       | 8            | 13             | 11             | 11                     | 14        | 14             | 12                     | 14                       | 11        | 10                   | 12                     | 11                    | 11                    | 11                   |
| Parkinson’s disease              | 11     | 10        | 11             | 12      | 12           | 9              | 9              | 8                      | 9         | 12             | 11                     | 12                       | 11        | 10                   | 13                     | 13                    | 12                    | 13                   |
| Other neurological disorders     | 12     | 12        | 12             | 11      | 11           | 10             | 12             | 9                      | 10        | 10             | 10                     | 12                       | 8         | 10                   | 12                     | 12                    | 12                    | 8                    |
| Tetanus                          | 13     | 15        | 13             | 14      | 15           | 15             | 15             | 15                     | 15        | 15             | 15                     | 15                       | 15        | 15                   | 15                     | 15                    | 15                    | 15                   |
| Multiple sclerosis               | 14     | 14        | 15             | 15      | 13           | 11             | 13             | 13                     | 13        | 12             | 11                     | 13                       | 15        | 14                   | 14                     | 14                    | 14                    | 14                   |
| Motor neuron diseases            | 15     | 13        | 14             | 14      | 14           | 14             | 12             | 11                     | 12        | 14             | 12                     | 14                       | 13        | 14                   | 13                     | 14                    | 14                    | 14                   |
What is the **IMPACT** of epilepsy?

50 000 000
More than 50 million people are living with epilepsy globally

3-6 TIMES
GREATER RISK
OF PREMATURE DEATH

80%
live in low- and middle-income countries

75%
do not receive treatment

**CAUSES OF TREATMENT GAP:**
- lack of trained staff
- poor access to anti-epileptic medicines
- societal misconceptions
- poverty
- low prioritization for the treatment of epilepsy

**STIGMA & DISCRIMINATION**
- family
- work
- social standing
Definitions
Idiopathic epilepsy

An epilepsy of predominately genetic or presumed genetic origin and in which there is no gross neuroanatomic or neuropathologic abnormalities nor other relevant underlying diseases.
An epilepsy in which a specific systemic or environmental factor is the predominant precipitant of the seizures
Cryptogenic epilepsy

An epilepsy of presumed symptomatic nature in which the cause has not been identified.
Symptomatic epilepsy

An epilepsy predominately due to a gross neuroanatomical or neuropathological abnormality or a relevant systemic disease, which can be acquired or genetic in origin.
Symptomatic epilepsy

Genetic or developmental causation
(e.g. progressive myoclonic epilepsies, neurocutaneous syndromes...)

Acquired causation
(e.g. hippocampal sclerosis, perinatal causes, cerebral trauma, cerebral tumor, cerebral infection, cerebral immunologic disorders, degenerative conditions...
Aetiologies in the African Region
The prevalence of symptomatic epilepsy is higher in developing countries.
Higher prevalence rates of epilepsy in LMICs are likely due to symptomatic epilepsies.
An estimated 25% of symptomatic epilepsies are preventable.
The major preventable risk factors for epilepsy:

• perinatal insults
• central nervous system infections
• traumatic brain injury
• stroke
Perinatal risk factors

33%

- Short gestational age at delivery
- Low birth weight
- Maternal health conditions: low nutritional status, pre-eclampsia
- Presence and skill of birth attendants
- Method of delivery
- Hypoxic-ischemic encephalopathy
- Neonatal hypoglycaemia
- Perinatal infection (human immunodeficiency virus, …)
- …
All endemic causes of infection can involve the brain, at all ages!
Traumatic brain injury

• Road traffic injuries
• Falls
• Violence, armed conflict

Severe injury → higher risk!

4%
Strokes after stroke
- ↑ premature mortality
- ↑ disability

Common cause of status epilepticus
2.7%
Prevention

Primary prevention

Secondary prevention

Acute brain injury (initial precipitating illness) ± Acute symptomatic seizures

First, late unprovoked seizure

Epilepsy: recurrent unprovoked seizures

LIFESPAN
<table>
<thead>
<tr>
<th>Cause</th>
<th>Estimated attributable fraction</th>
<th>Primary preventive measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre- and perinatal insults</strong></td>
<td></td>
<td>Maternal and child health care systems with universally available: screening for pregnancy complications; trained birth attendants and hygienic birthing environments; referral to obstetrical and neonatal care as needed; and standardized protocols for care during the pre-, peri- and postnatal periods</td>
</tr>
<tr>
<td>E.g. prematurity, fetal exposures to infections, toxins, cerebral haemorrhage or infarction, hypoxic-ischaemic encephalopathy</td>
<td>5% (HIC)  11% (LMIC)</td>
<td></td>
</tr>
<tr>
<td><strong>Central nervous system infections</strong></td>
<td></td>
<td>Communicable disease control programmes making universally available: immunizations for <em>H. influenzae</em> b, <em>N. meningitidis</em> and <em>S. pneumoniae</em>; malaria control programmes in endemic areas; and hygienic pig husbandry programmes and human sanitary waste management</td>
</tr>
<tr>
<td>E.g. bacterial meningitis, viral encephalitis, parasitosis</td>
<td>2% (HIC)  5% (LMIC)</td>
<td></td>
</tr>
<tr>
<td><strong>Traumatic brain injury</strong></td>
<td></td>
<td>Multiple road traffic safety measures and programmes; fall prevention measures for children, older adults and high-risk occupations; violence prevention programmes</td>
</tr>
<tr>
<td>E.g. attributable to road traffic collision, falls and violence</td>
<td>5% (HIC)  4% (LMIC)</td>
<td></td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td></td>
<td>Individual interventions and community programmes to reduce cardiovascular risk factors: e.g. hypertension, diabetes mellitus, hyperlipidaemia, obesity and tobacco use</td>
</tr>
<tr>
<td>Cerebral infarction and haemorrhage</td>
<td>12% (HIC)  3% (LMIC)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>See above</td>
</tr>
<tr>
<td>Combined pre- and perinatal insults, CNS infection, traumatic brain injury and stroke</td>
<td>25% (HIC)  24% (LMIC)</td>
<td></td>
</tr>
</tbody>
</table>
Secondary prevention
Secondary prevention

Antiseizure medication
All available compounds can be prescribed.
Usually long-term treatment is indicated.
Secondary prevention

Pre- and perinatal insults

- Hypothermia
- Intravenous magnesium
- Calcium channel blocking agents flunarazine
Secondary prevention

Central nervous system infections

- Antibiotic, antiviral, antiparasitic agents (albendazole for NCC, ...)
  → cyst resolution
  → improved seizure control?
- Antiseizure medication for malaria
  → acute seizure reduction!
  → late unprovoked seizure reduction?
Secondary prevention
Traumatic brain injury

Prophylactic use of antiseizure medicines for a period during and following TBI recovery.
Secondary prevention

Stroke

• Influence of thrombolytic or endovascular stroke therapy on epilepsy risk?
• Antiseizure medication as prevention for post-stroke epilepsy?
Key messages

Preventing epilepsy is an urgent unmet need.
Effective interventions for primary prevention are available.
Key messages

Effective interventions for primary prevention delivered as part of ...
Key messages

... broader public health responses in maternal and newborn health care, communicable disease control, injury prevention and cardiovascular health.
The time to act is NOW.

Urgent actions are needed, and these include:

- **Promote** epilepsy as a public health priority to reduce its burden.
- **Improve** public attitudes, reduce stigma and promote protection of the rights of people with epilepsy.
- **Invest** in health and social care systems to improve accessibility to epilepsy care.
- **Enhance** access to cost-effective antiseizure medications globally.
- **Prevent** acquired epilepsies through improved care for common causes, such as perinatal injury, central nervous system infections, stroke and traumatic brain injuries.
- **Increase** priority given to epilepsy in research agendas.