Prevalence of Active Convulsive Epilepsy in sub-Saharan Africa: Data from INDEPTH Epilepsy Studies

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INDEPTH – SEEDS Group.
Outline

• Epilepsy in Low and Middle Income Countries (LMIC)
• Epidemiology: HIC* Vs. LMIC
• Epilepsy in SSA – the SEEDS study

  Background and Objectives
  Prevalence Methods
  Results
  Discussion

*(High Income Countries)
Epilepsy in developing countries

- Common: Affects ~ 70 M people worldwide
- LMIC - Up to 63M PWE (90% of global burden)
- Important cause of disability and mortality
  - Estimates based upon little data
- Heterogeneity – clinical or methodological?
- Socio-cultural misunderstanding
- Comorbidity: Social, Cognitive, Psychiatric
- Can be controlled in > 75% of cases
- But 56% (range; 31 – 100) not on medication
Heterogeneity in prevalence

Figure 3: Forest Plot for the LTE prevalence data from developed countries.

Figure 4: Forest Plot for the LTE prevalence data from developing countries.
SEEDS - Background

• Expression of interest – 2006 INDEPTH AGM
• 12 HDSS sites initially interested
• 5 Sites in the current study:
  Agincourt HDSS – South Africa
  Iganga-Mayuge HDSS – Uganda
  Ifakara HDSS – Tanzania
  Kilifi HDSS – Kenya
  Kintampo HDSS – Ghana

• Funding from The Wellcome Trust - 2007
Objectives of SEEDS

- Determine prevalence of ACE in ALL sites
- Determine heterogeneity of prevalence
- Determine risk factors for development of epilepsy
- Determine mortality rate in PWE
- Determine factors associated with mortality
Methods
Estimating prevalence of ACE

**Stage I**
Census team
2 item tool
History of convulsions

**Stage II**
Epilepsy field team
10 item tool
High specificity
Possible ACE identified

**Stage III**
Clinical exam
Diagnosis of ACE
Classification
Confirmation
Analysis

• Prevalence estimates:
  Confirmed cases of ACE in Stage III
  Total population eligible in Stage I

• Multiple Imputation (MI):
  Adjust for between-stage attrition

• Forest Plots: Assess heterogeneity of ACE

• Random-effects regression:
  Adjust between-site variation
  Pool prevalence estimates
Results
Flow of participants (4 sites)

**STAGE I**
- Eligible population: (N=490,699)
- Screened in SI (n=472,788)
  - Positive (n=11,742)
  - Negative (n=461,046)
  - Lost in SI/SII (n=1,856; 15.8%)

**STAGE II**
- Screened in SII (n=9,886)
  - Positive (n=2,482)
  - Negative (n=7,404)
  - Lost in SI/SII (n=1,856; 15.8%)

**STAGE III**
- Assessed in SIII (n=2,095)
  - Positive (n=1,455)
  - Negative (n=640)
  - Lost in SII/SIII (n=387; 15.4%)
## Crude Prevalence of ACE

<table>
<thead>
<tr>
<th>Study site</th>
<th>Screened in SI</th>
<th>Positive in SI (%)</th>
<th>Screened in SII (% of positive in SI)</th>
<th>Positive in SII</th>
<th>Assessed in SIII (% of positive in SII)</th>
<th>Positive in SIII</th>
<th>Crude Prevalence (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilifi HDSS</td>
<td>232176</td>
<td>5152 (2.2)</td>
<td>4886 (94.6)</td>
<td>1123</td>
<td>948 (84.4)</td>
<td>699</td>
<td>3.0 (2.8-3.2)</td>
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<tr>
<td>Agincourt HDSS</td>
<td>82795</td>
<td>546 (0.7)</td>
<td>546 (100.0)</td>
<td>354</td>
<td>328 (92.7)</td>
<td>245</td>
<td>3.0 (2.6-3.3)</td>
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<tr>
<td>Iganga HDSS</td>
<td>64172</td>
<td>4655 (7.2)</td>
<td>3130 (67.2)</td>
<td>475</td>
<td>308 (64.8)</td>
<td>145</td>
<td>2.3 (2.0-2.6)</td>
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<tr>
<td>Ifakara HDSS</td>
<td>93645</td>
<td>1389 (1.5)</td>
<td>1321 (95.1)</td>
<td>528</td>
<td>481 (91.1)</td>
<td>366</td>
<td>3.9 (3.5-4.3)</td>
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<tr>
<td>Kintampo HDSS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Overall</td>
<td>472788</td>
<td>11472 (2.5)</td>
<td>9886 (84.2)</td>
<td>2482</td>
<td>2095 (84.8)</td>
<td>1455</td>
<td>3.1 (2.9-3.2)</td>
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</table>
## Adjusted prevalence of ACE

<table>
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<th>Study site</th>
<th>Population</th>
<th>Screened in SI</th>
<th>Crude Prevalence</th>
<th>Adjusted for attrition</th>
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<tr>
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<td>93645</td>
<td>366</td>
<td>3.9 (3.5-4.3)</td>
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<tr>
<td>Kintampo HDSS</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>490699</td>
<td>472788</td>
<td>1455</td>
<td>3.1 (2.9-3.3)</td>
</tr>
</tbody>
</table>
Heterogeneity of prevalence

Combined

Ifakara

Iganga

Agincourt

Kilifi

adjusted
Discussion

• Largest prevalence study in LMIC
• Novel 3-stage methodology
• Utility of HDSS infrastructure
• Standardized methodology
• Heterogeneity of ACE between sites
  – Clinical Heterogeneity (patient and risk factor differences)
  – SEEDS case-control studies to elucidate causes
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[Logo: INDEPTH Network]
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