

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

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# 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)

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# 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.

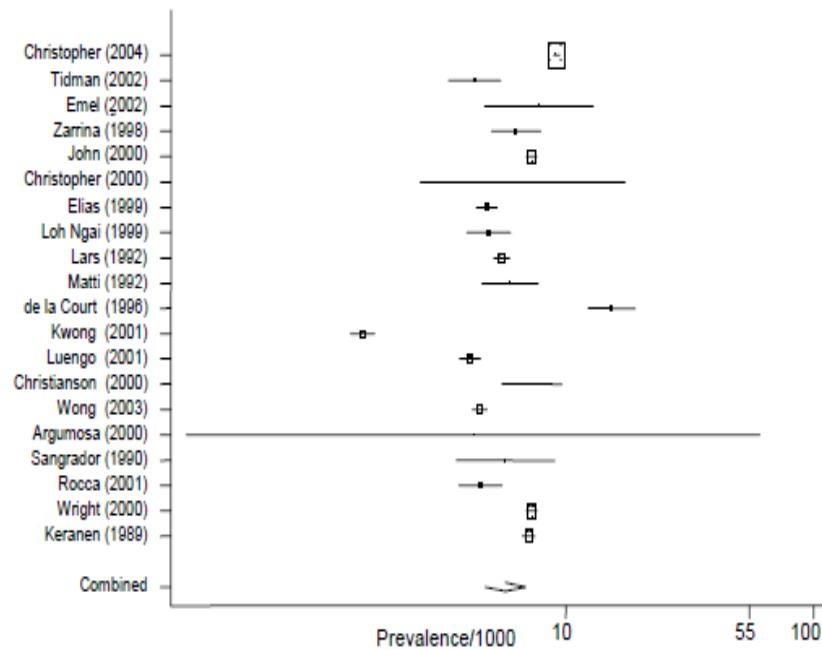
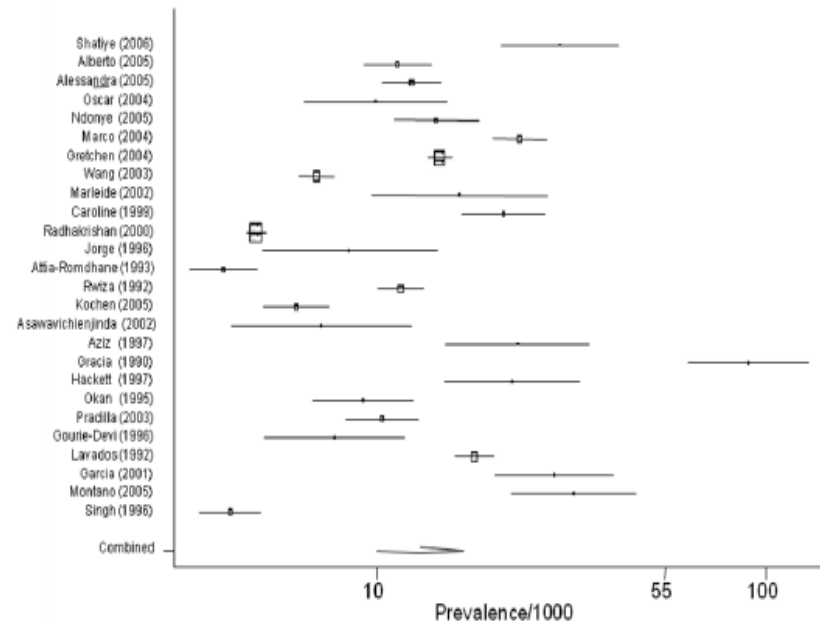


Figure 4: Forest Plot for the LTE prevalence data from developing countries.



# 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



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# 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

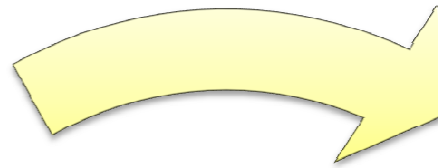


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# Estimating prevalence of ACE

## Stage I

Census team  
2 item tool  
History of  
convulsions

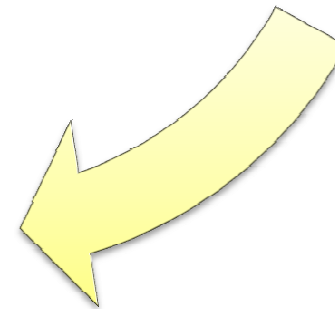


## Stage II

Epilepsy field team  
10 item tool  
High specificity  
Possible ACE identified

## Stage III

Clinical exam  
Diagnosis of ACE  
Classification  
Confirmation





# Analysis

- Prevalence estimates:  
$$\frac{\text{Confirmed cases of ACE in Stage III}}{\text{Total population eligible in Stage I}}$$
- Multiple Imputation (MI):  
Adjust for between-stage attrition
- Forest Plots: Assess heterogeneity of ACE
- Random-effects regression:  
Adjust between-site variation  
Pool prevalence estimates

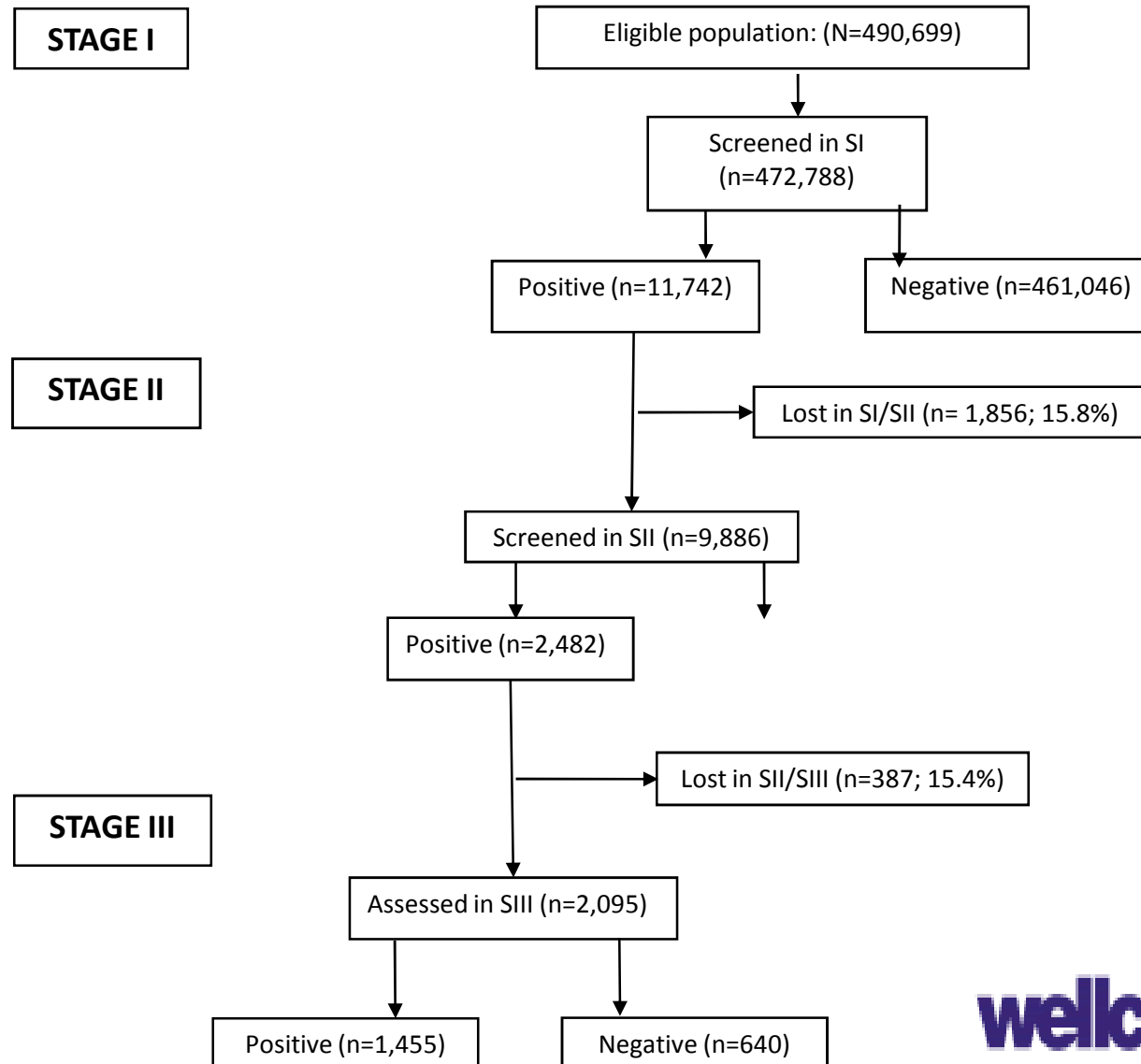


# Results



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# Flow of participants (4 sites)



# Crude Prevalence of ACE

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

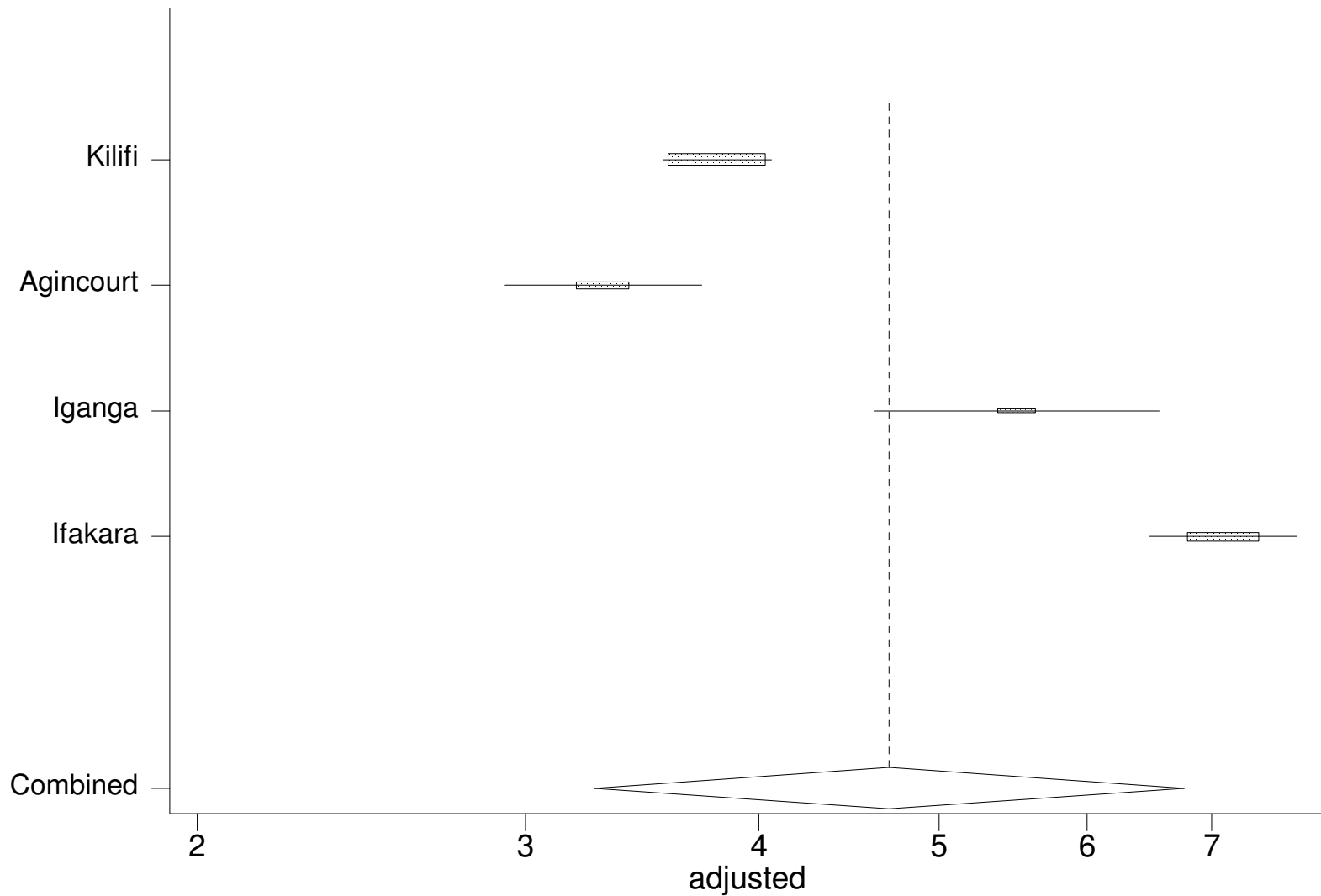


# Adjusted prevalence of ACE

Study site	Population	Screened in SI	Crude Prevalence		Adjusted for attrition
			Observed Cases	CP (95% CI)	AP (95% CI)
Kilifi HDSS	233881	232176	699	3.0 (2.8-3.2)	3.8 (3.5-4.0)
Agincourt HDSS	83121	82795	245	3.0 (2.6-3.3)	3.3 (2.9-3.7)
Iganga HDSS	68808	64172	155	2.4 (2.1-2.8)	5.5 (4.5-6.4)
Ifakara HDSS	104889	93645	366	3.9 (3.5-4.3)	7.1 (6.5-7.8)
Kintampo HDSS	-	-	-	-	-
<b>Overall</b>	490699	472788	1455	3.1 (2.9-3.3)	<b>4.8 (3.0-6.7)</b>



# Heterogeneity of prevalence



# 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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Thank you



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