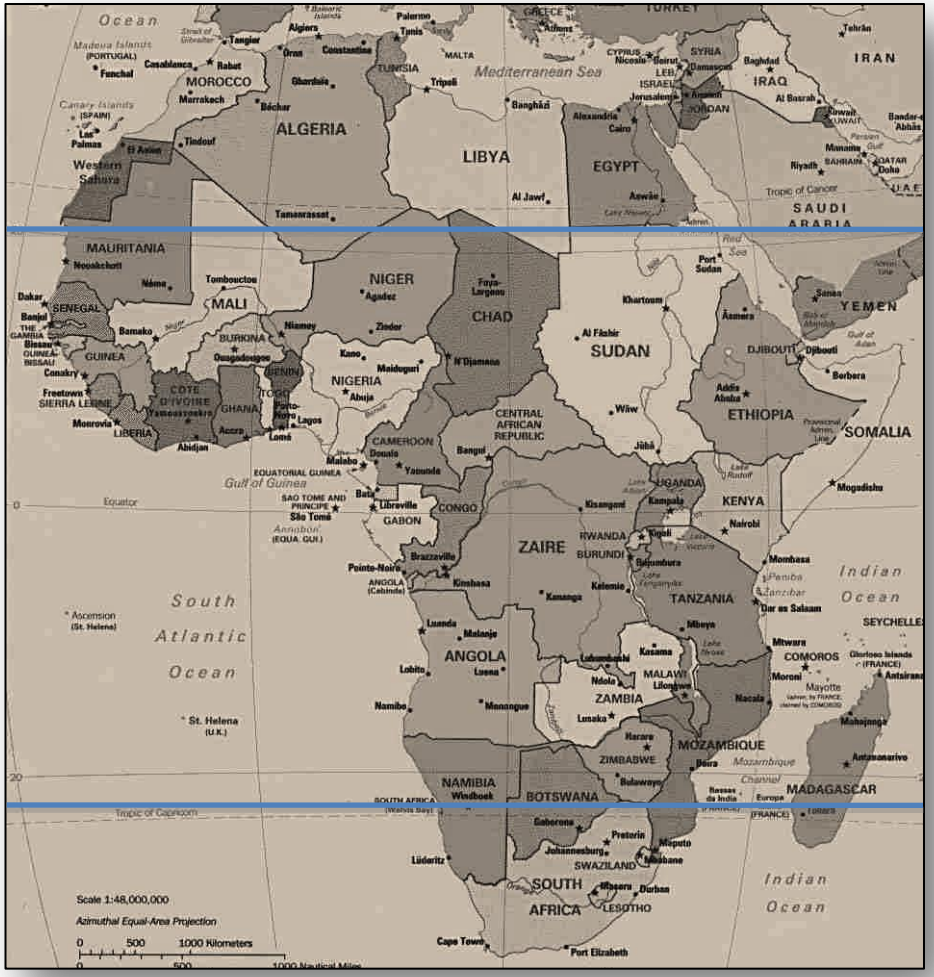
Challenges For Treating Critical illness in children in sub Saharan African

Professor Kath Maitland
Imperial College, London
Based at
KEMRI Wellcome Trust Programme,
Kilifi, Kenya

Maitland group– research portfolio

- Child survival : improving hospital care
- Evidence base guideline development
- Severe malaria/ Sepsis
  - pathophysiology
  - fluid resuscitation trials
- Severe malnutrition
  - severity indicators
  - Pathogenesis and intervention

Managing severe sepsis in sub Saharan Africa



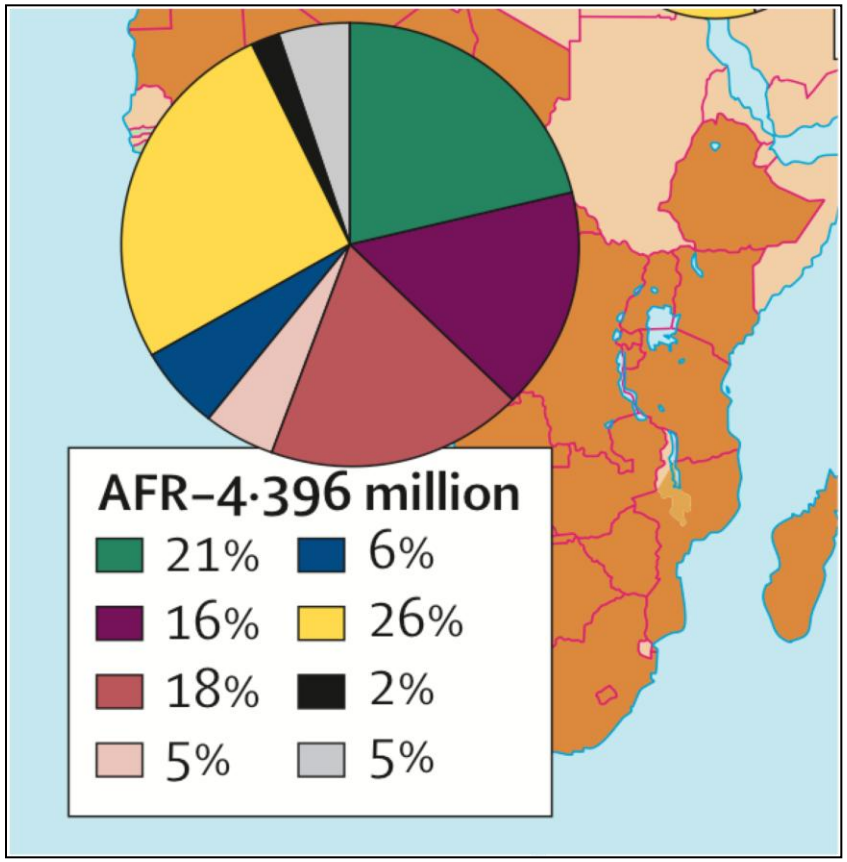
Focus:

- Poorest ED countries
- Paediatric *(vs adult)* Sepsis
- Pragmatic diagnosis and management
- Generalisable to hospitals with limited infrastructure

Soroti Hospital, Uganda
8000 admissions per year

Challenges of Treating Sepsis in Africa

Africa: Leading causes of under 5y mortality



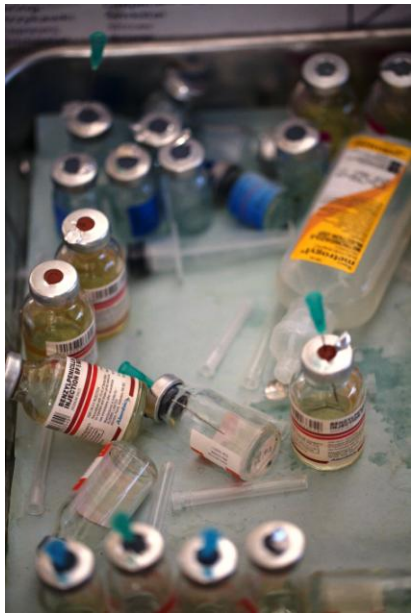
Causes (pies)

- Pneumonia
- Diarrhoea
- Malaria
- Measles
- HIV/AIDS
- Neonatal causes
- Injuries
- Others

Simple treatments: evidence base?

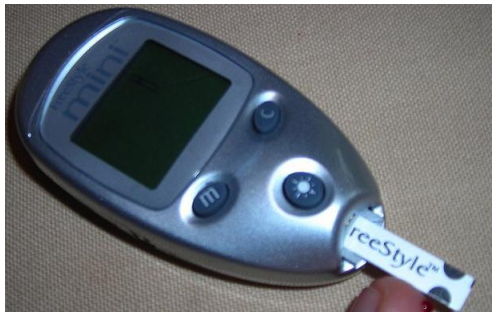
✓FEAST trial

Oxygen

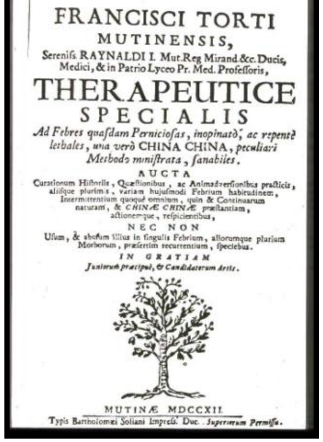


Transfusion

Glycaemia correction



Antibiotics



Anti-malarials: AQUAMAT

Large pragmatic trial in 5465 children with severe malaria in 10 sites across Africa

Primary outcome in-hospital mortality

- ✓ Quinine 297/2713 (11.0%)
- ✓ Artesunate 230/2712 (8.5%)

- ✓ **Stratified Risk Ratio 0.78** (95%CI: 0.66 to 0.91; *p=0.002*)

Dondorp Lancet 2010

Clinical descriptive/epidemiological

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

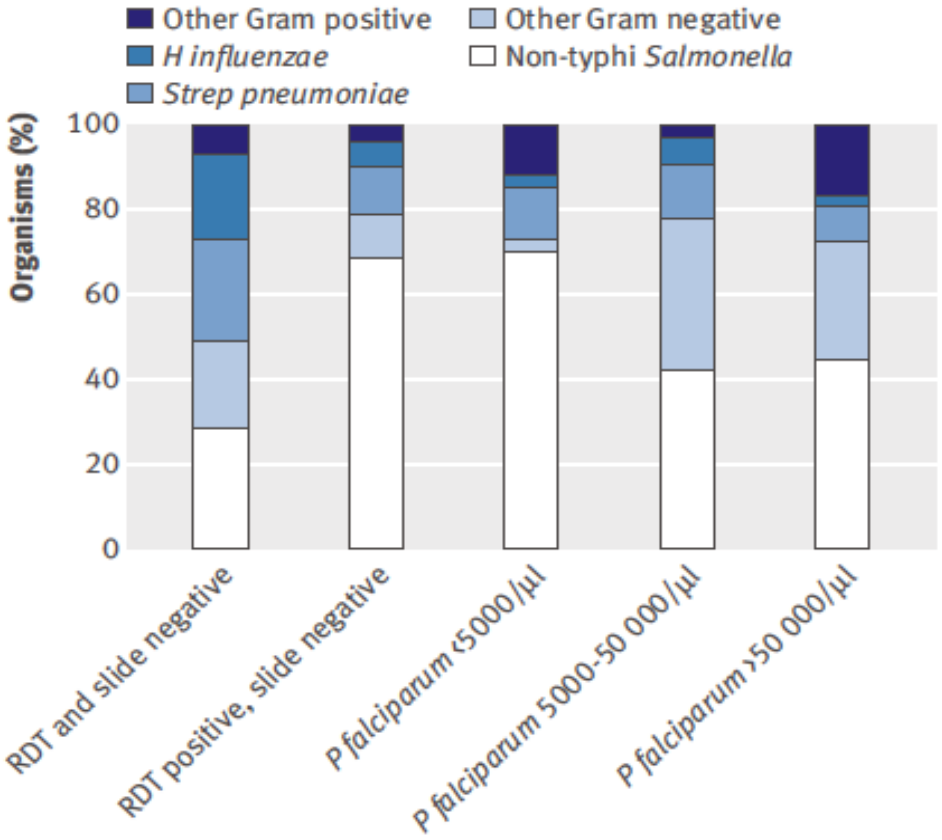
Bacteremia among Children Admitted to a Rural Hospital in Kenya

James A. Berkley, M.D., Brett S. Lowe, M.Phil., Isaiah Mwangi, M.B., B.Ch., Thomas Williams, Ph.D., Evasius Bauni, M.Sc., Saleem Mwarumba, H.N.D., Caroline Ngetsa, H.N.D., Mary P.E. Slack, F.R.C.Path., Sally Njenga, H.N.D., C. Anthony Hart, F.R.C.Path., Kathryn Maitland, Ph.D., Mike English, M.D., Kevin Marsh, F.R.C.P., and J. Anthony G. Scott, M.R.C.P.

Database : prospective study of **20,000 unselected admissions**

- ✓ 25% of childhood deaths due to community acquired bacteraemia.
- ✓ *Strep pneumoniae*, non-typhoidal salmonella, *H. influenzae* & *E. coli* accounted for > 70% of isolates (in post neonatal age group)

Microbiology of sepsis?



3639 febrile Tanzanian children

WHO guideline identified only 50% of IBD in non malaria patients

Mortality 17% for IBD vs 4% for non-IBD

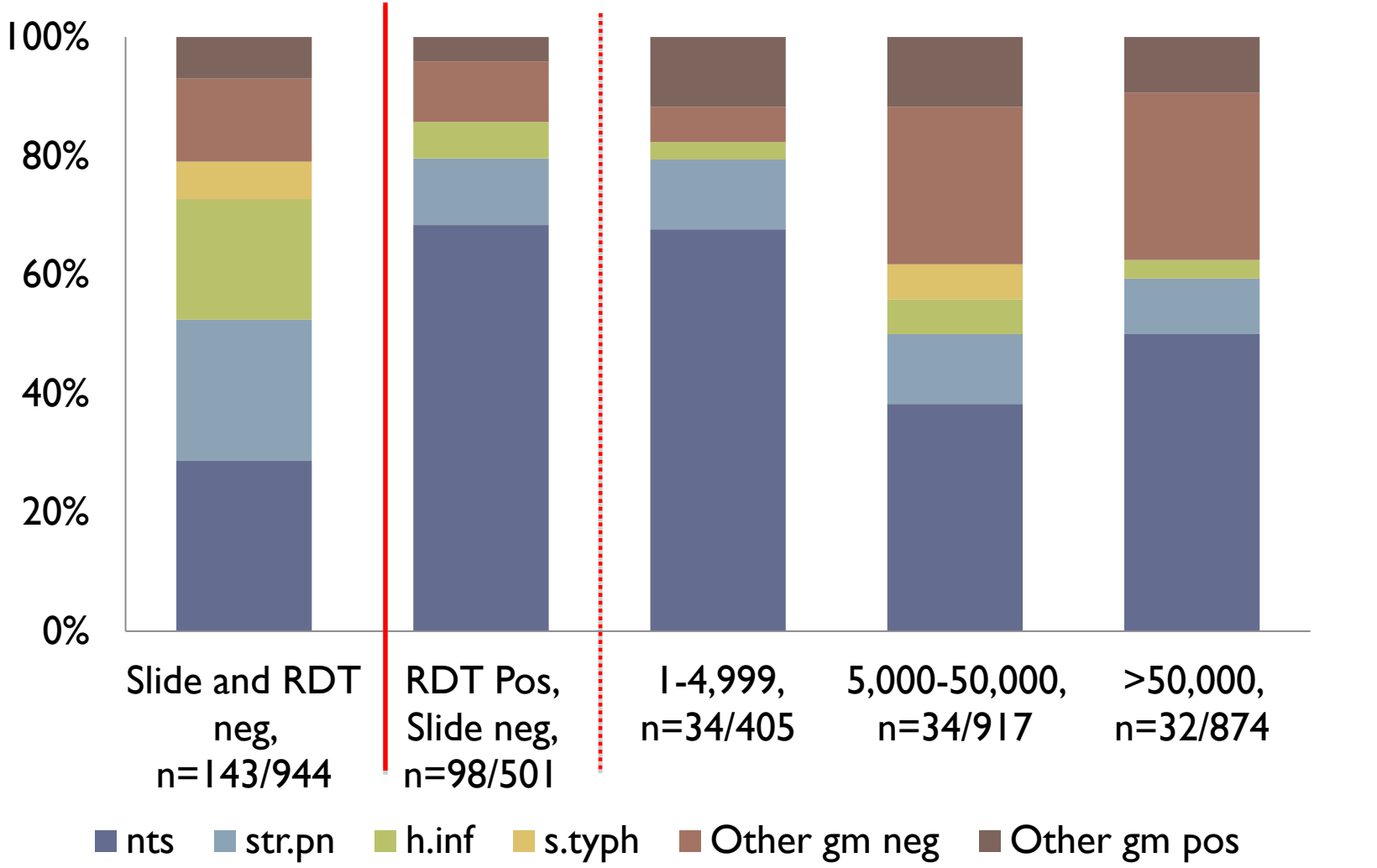
Meningitis/CNS Syndromes: Major organisms :Step Pneu & H,Inf

All other syndrome (malaria, pneumonia) similar pathogens eg NTS dominance

Susceptibility' of amp/ gent or chloramphenicol < 50% of infections

Proportion of organisms by different categories of *P.falciparum* infection

Nadjim et al BMJ 2010



Antimicrobials

Major Challenges

- Limited pharmacopeia
- Few reports of resistance patterns
- Hib Vaccine- reduced potential threat to pharmacopeia
- Ceftriaxione recommended for all CNS infection
- Non-typhoidal salmonellae (NTS)- implications for morbidity/mortality
- Therapeutic options limited for NTS
- NTS frequently associated with anaemia, HIV, malnutrition

Graham and English Lancet 2009