



Incidence and Antimicrobial Resistance Profile of Salmonella Bacteraemia Among Children in sub-Saharan Africa: RTS,S/AS01 Salmonella Ancillary Study

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Ancillary Study Team

11th International Conference on Typhoid and Other Invasive
Salmonellosis, Hanoi, Vietnam, March 26-28, 2019

11 sites selected to represent diversity of malaria endemicity in sub-Saharan Africa **agnostic to incidence of Salmonella disease**

Children randomised to receive:

- RTS,S-AS01 3 doses +/- booster
- Comparator vaccine

Cohorts: 6-12 weeks & 5-17 months

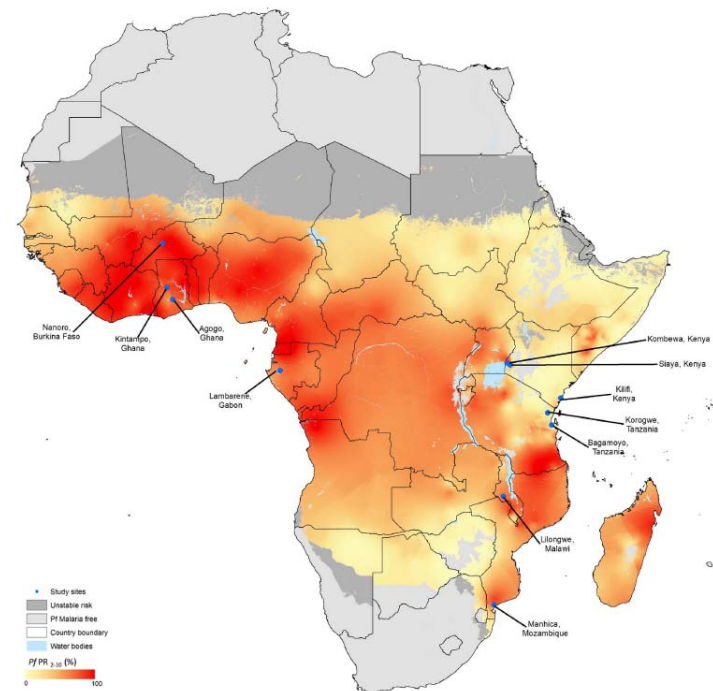
Median follow-up: 38 & 48 months

Duration: 2009 to 2014

Main exclusion criteria included

- Malnutrition requiring hospitalisation
- Severe anaemia (<5 g/dL)

The RTS,S-AS01 phase 3 trial: MAL055

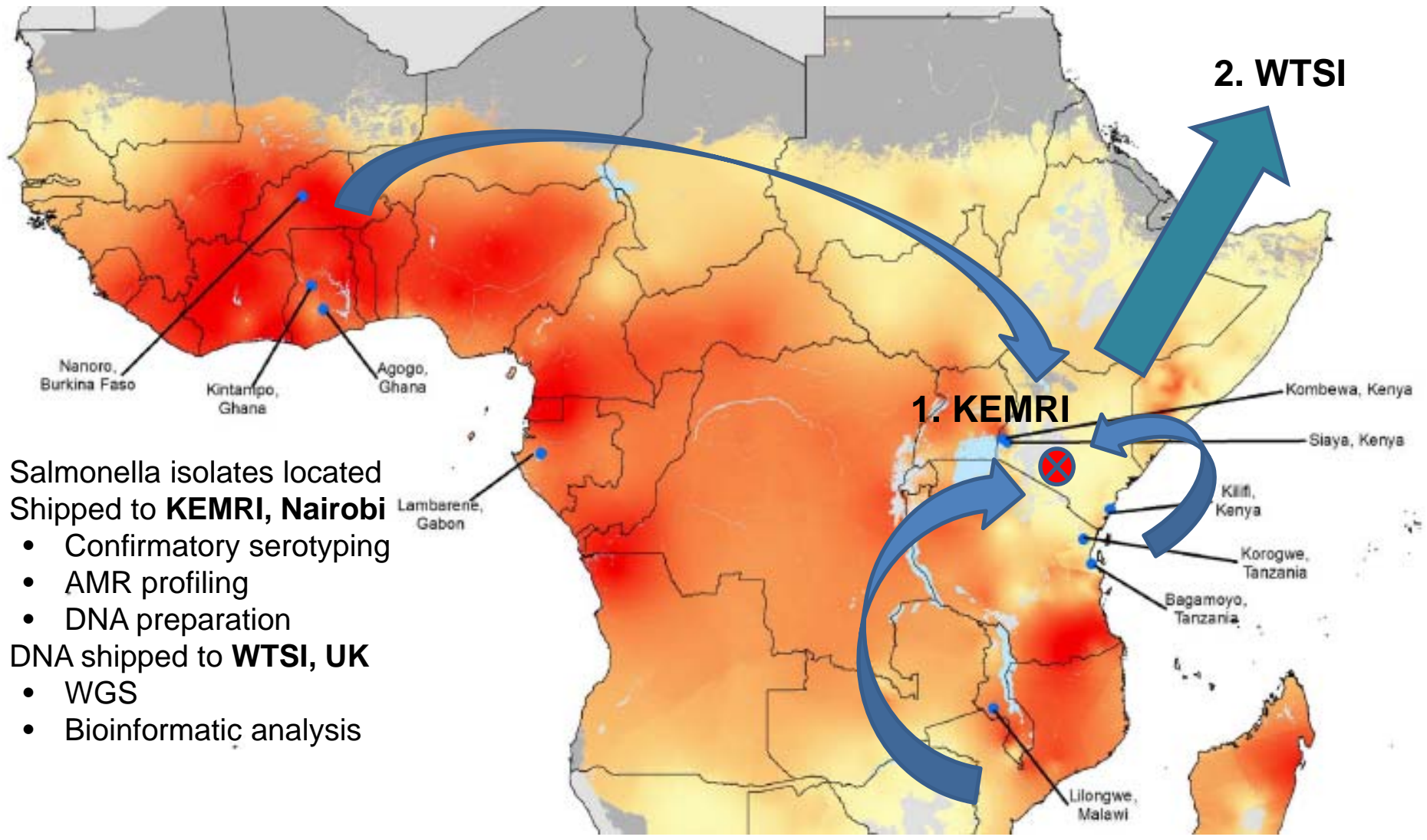


Aim: Use data from MAL055 to determine incidence of *Salmonella* bacteraemia in children under five years across sub-Saharan Africa.

Workshop held in Nairobi, Kenya, September 2016

- 15,460 children enrolled
- Mean baseline Hb = 10.3 g/dl (IQR 9.3 to 11.2).
- Mean height-for-weight z score = 0.2 (IQR -0.7 to 1.1)
- HIV not systematically tested
- Incidence of clinical malaria
 - (min) Kilifi, Kenya 0.05 cases per person year
 - (max) Siaya, Kenya 4.41 and 5.41 per person year

Passive surveillance with blood cultures for febrile admissions



- Salmonella isolates located
- Shipped to **KEMRI, Nairobi**
 - Confirmatory serotyping
 - AMR profiling
 - DNA preparation
- DNA shipped to **WTSI, UK**
 - WGS
 - Bioinformatic analysis

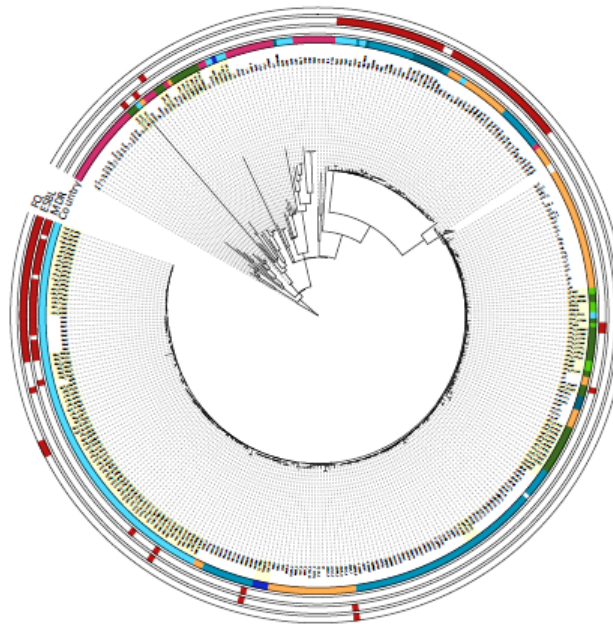


Genomic analysis

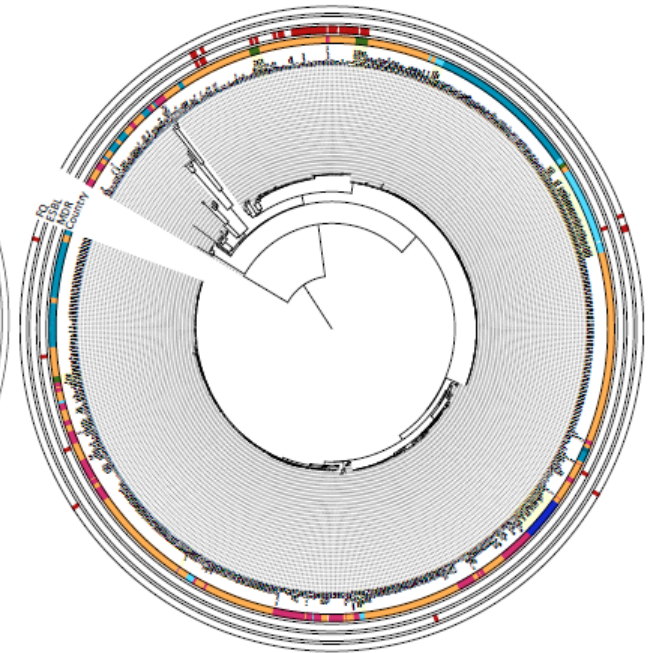
Sandra van Puyvelde

'Genomic Insights From Salmonella Bloodstream Infections Among Young African Children Identified During the MAL055 RTS,S/AS01 Salmonella Ancillary Study – see poster 174

Salmonella Typhimurium



Salmonella Enteritidis



iNTS disease antimicrobial resistance

- >60% MDR (ampicillin, chloramphenicol and cotrimoxazole)
- Ceftriaxone and fluoroquinolone resistance emerging in Africa – particularly in western Kenya sites

Conclusions

- *Salmonella* is a major and persistent cause of bacteremia among children under five years across sub-Saharan Africa
- High levels of MDR and resistance emerging to fluoroquinolones and ceftriaxone
- 3 commonest serovars: 1. *S. Typhimurium*, 2. *S. Enteritidis*, 3. *S. Typhi*
- Other serotypes in West Africa – notably *S. Dublin*
- iNTS disease 7x higher incidence than typhoid fever
- Greatest need for a *Salmonella* vaccine in Africa is a vaccine against iNTS disease

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