

WHAT HAVE WE LEARNED FROM THE
10,000 *Salmonella* GENOMES PROJECT
ABOUT THE WORLDWIDE EPIDEMIOLOGY,
TRANSMISSION AND VIRULENCE OF INTS?

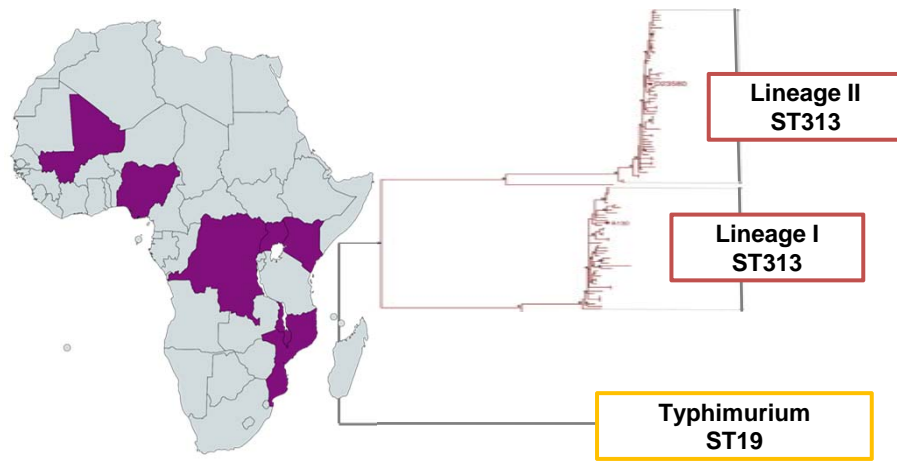
Blanca Perez-Sepulveda

Alex Predeus, Caisey Pulford, Ross Low, Nicholas Feasey, Neil Hall & Jay C. D. Hinton

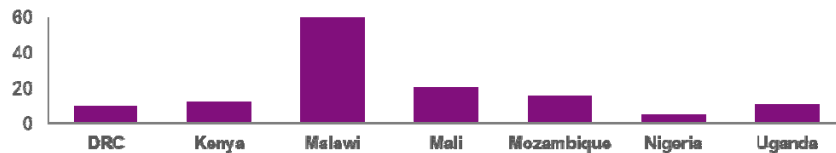
11th International Conference on Typhoid & Other Invasive Salmonellosis
March 26-28, 2019 - Hanoi, Vietnam

iNTS cause systemic disease in sub-Saharan Africa

S. Typhimurium: 2 distinct phylogenetic lineages

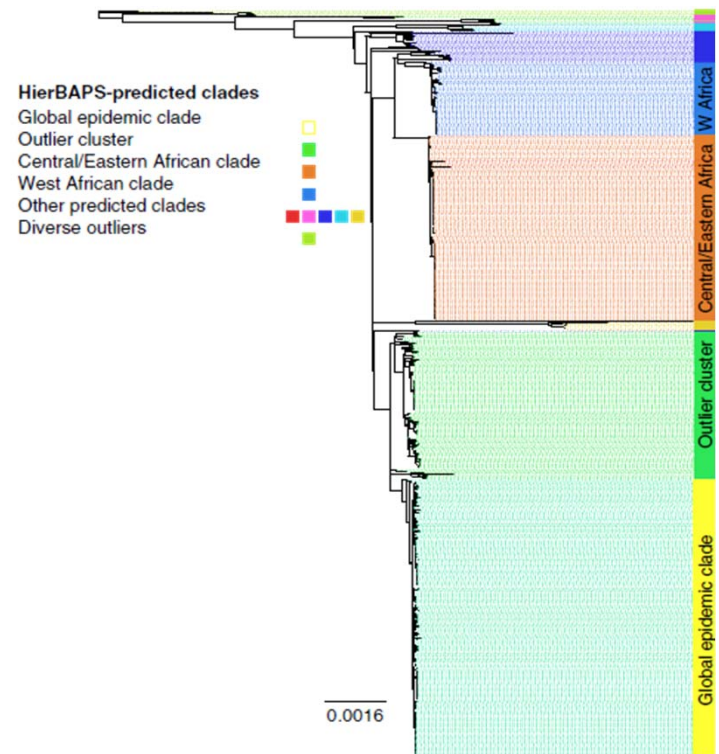


Okoro et al. (2012) Nature Genetics

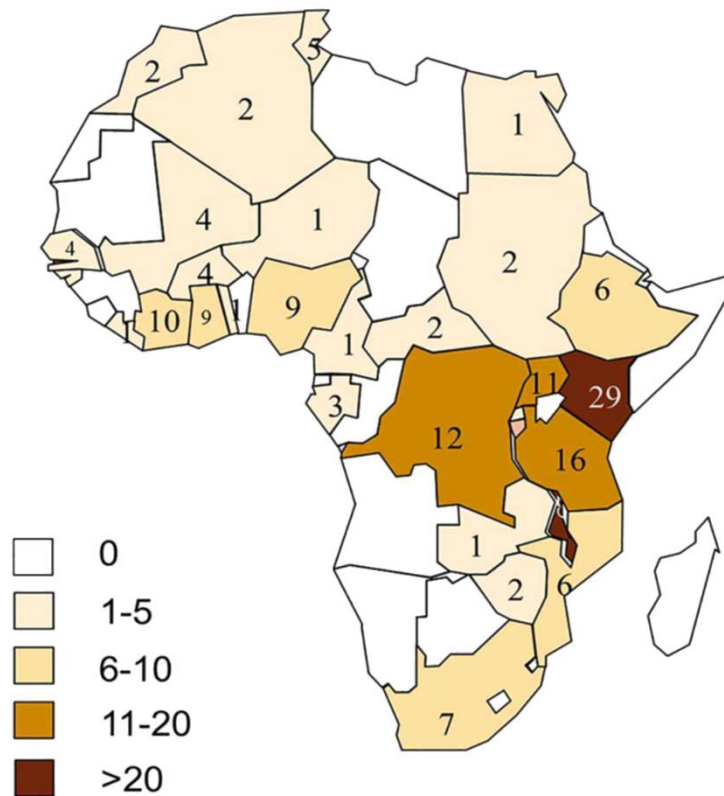


129 iNTS genomes sequenced from 7 countries in sub-Saharan Africa

S. Enteritidis: African clades



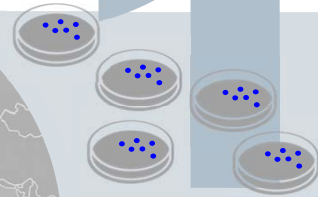
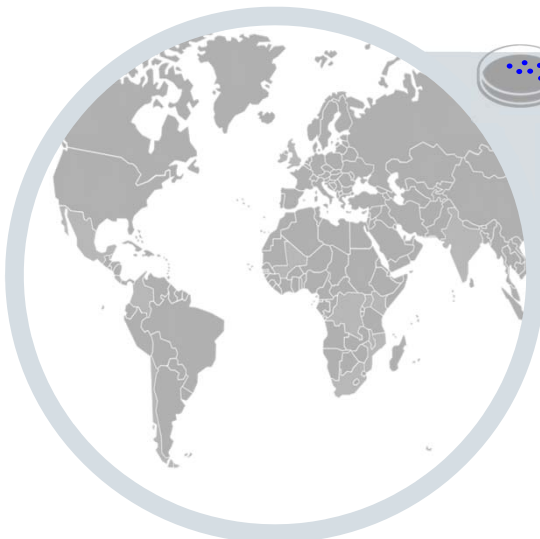
Feasey et al. (2016) Nature Genetics



- More genomic data needed
- Most iNTS studies from 5 African countries
- Source and transmission?
- Antibiotic sensitive strains
- Evolution in action (previous studies were time-limited snapshots)

What is the situation in the rest of the world?

Salmonella isolated from different sources:
clinical, animal and environmental



10,000
Salmonella
GENOMES

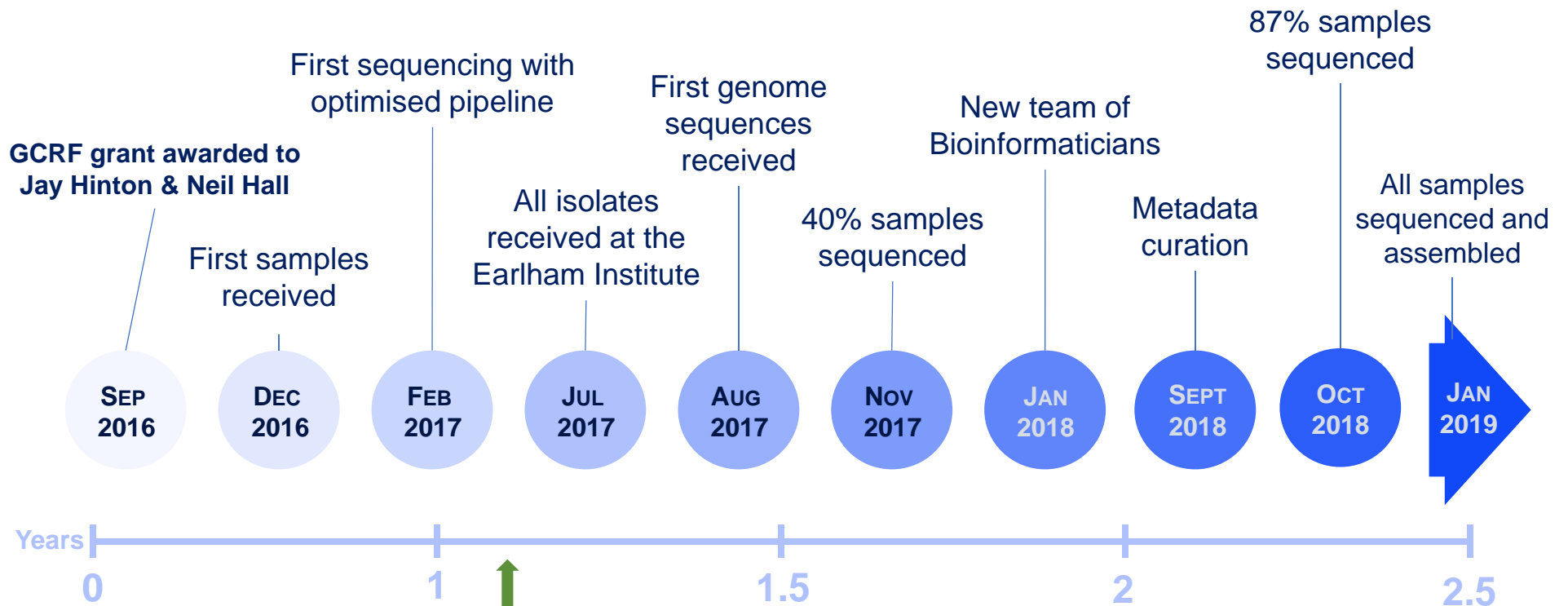
- Live bacteria
- Thermolysates
- DNA

Genome
sequence data
is available to
collaborators

DNA extraction and sequencing
was performed at the
Earlham Institute



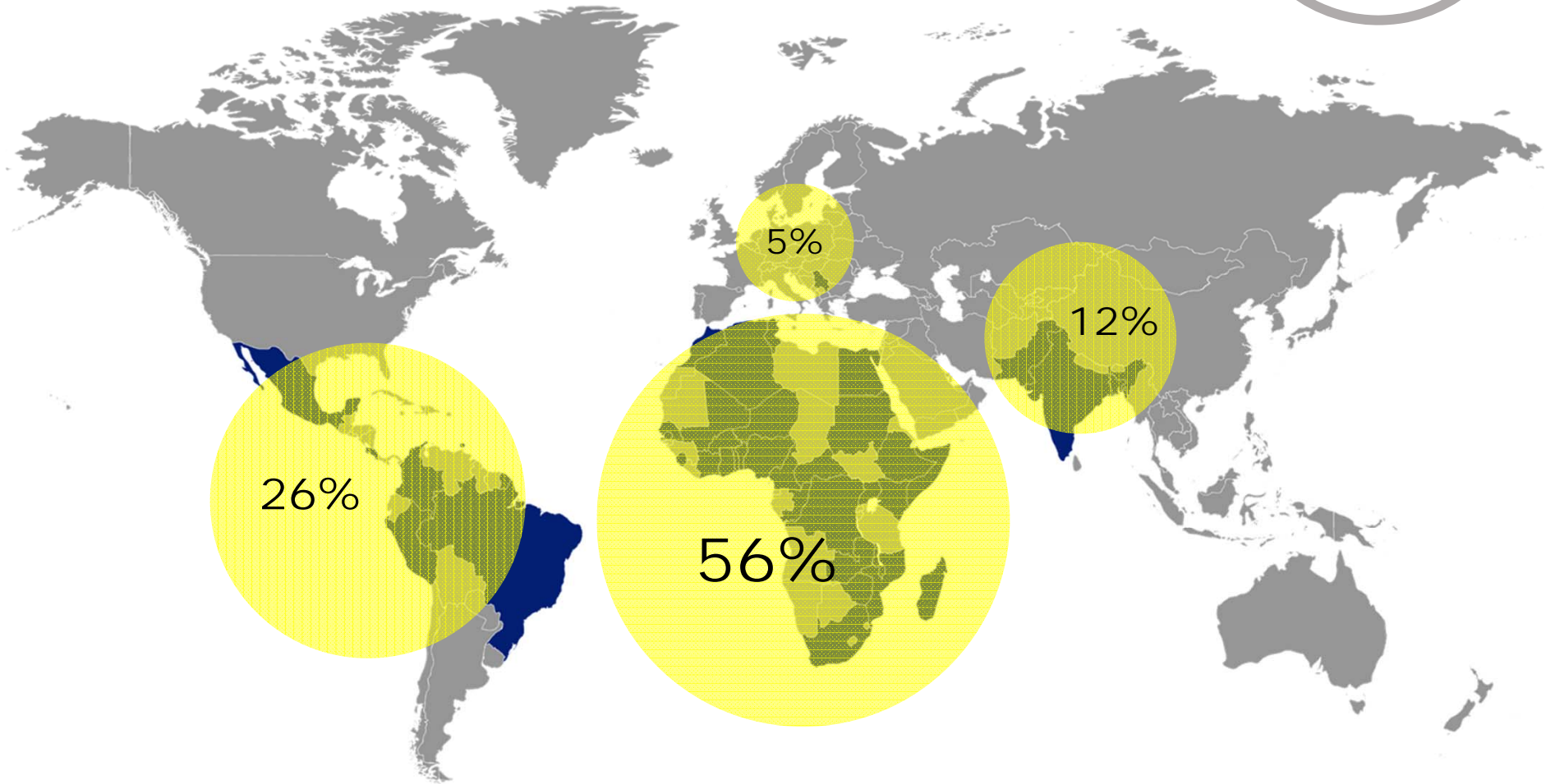
10301

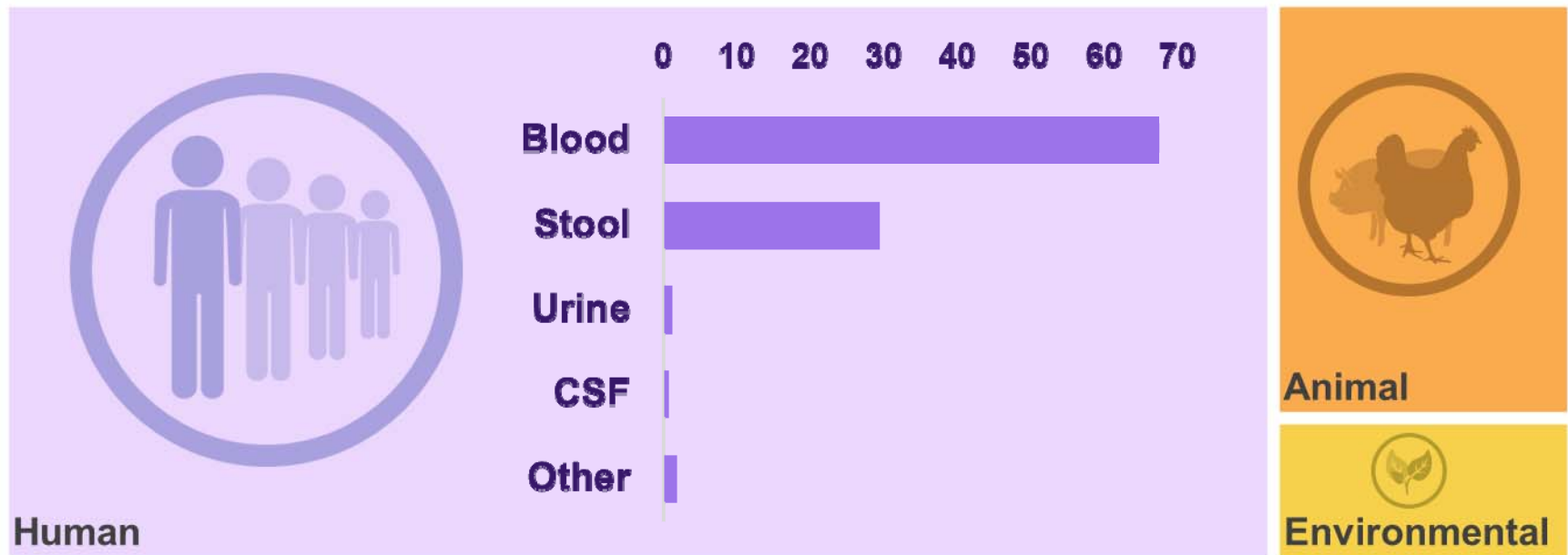
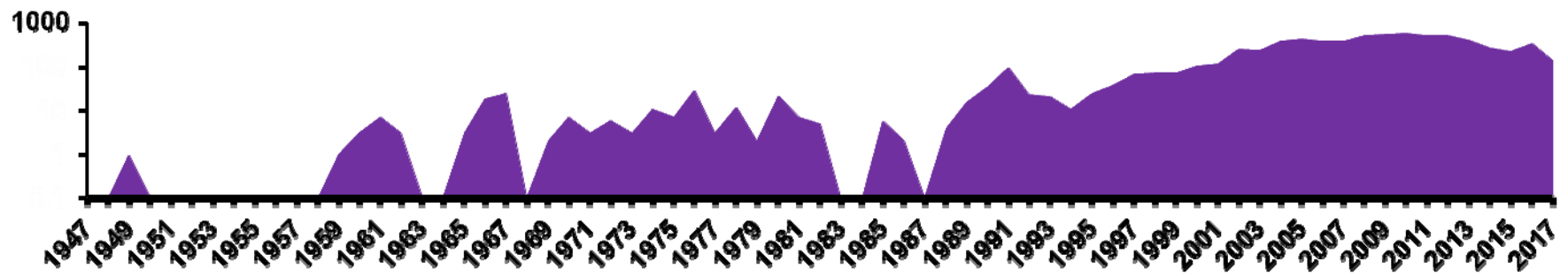


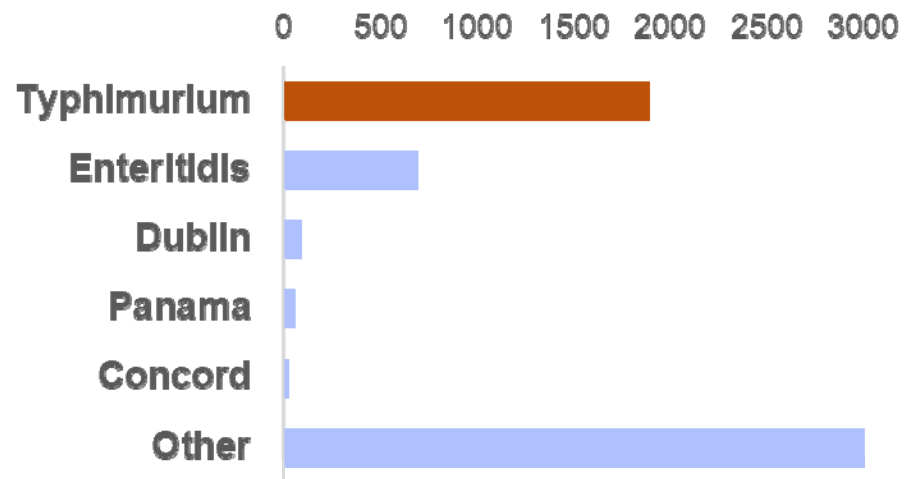
↑
COALITION
AGAINST
TYPHOID
Kampala 2017

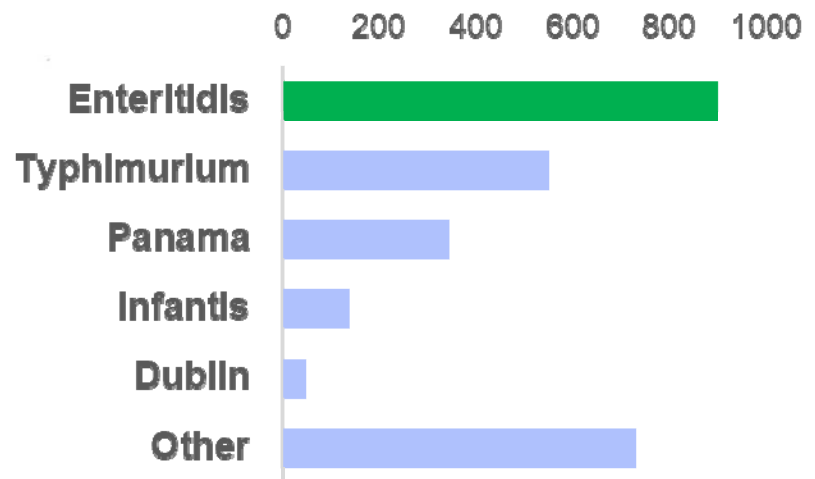
10301

51
Countries/Territories



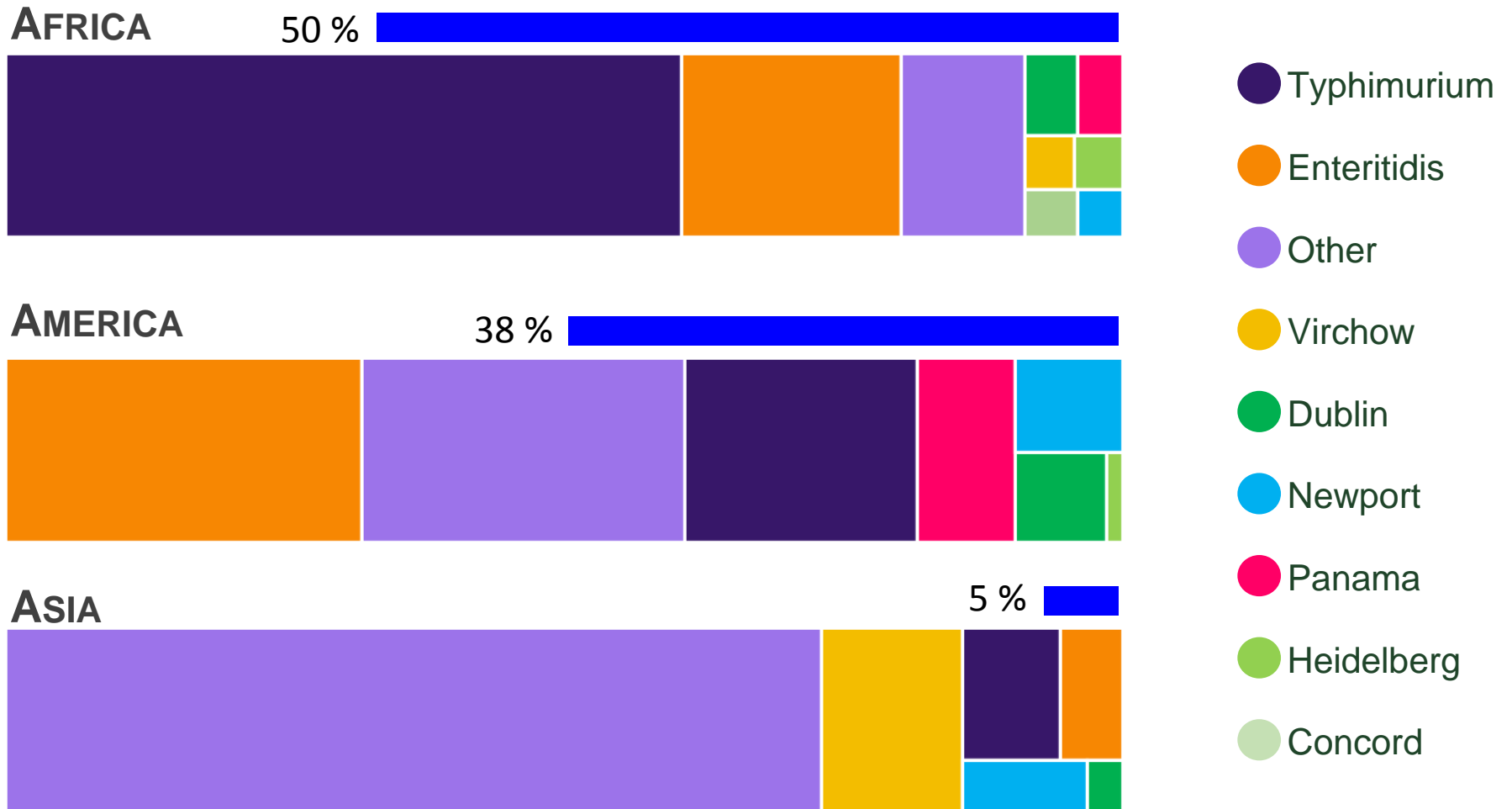






5816

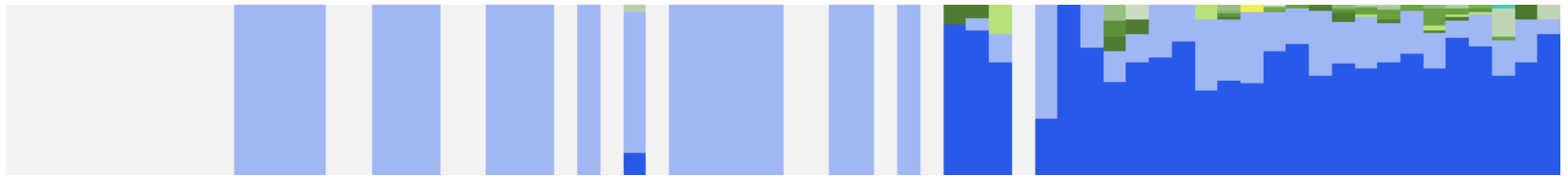
Salmonella genomes that passed QC



ANALYSIS OF AFRICAN *S. TYPHIMURIUM* GENOMES

Sequence Type

- 313
- 19
- Other



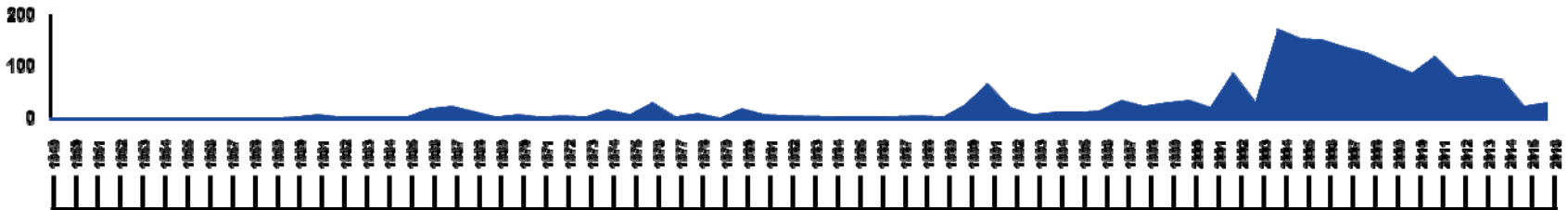
Cumulative Geographical Sampling



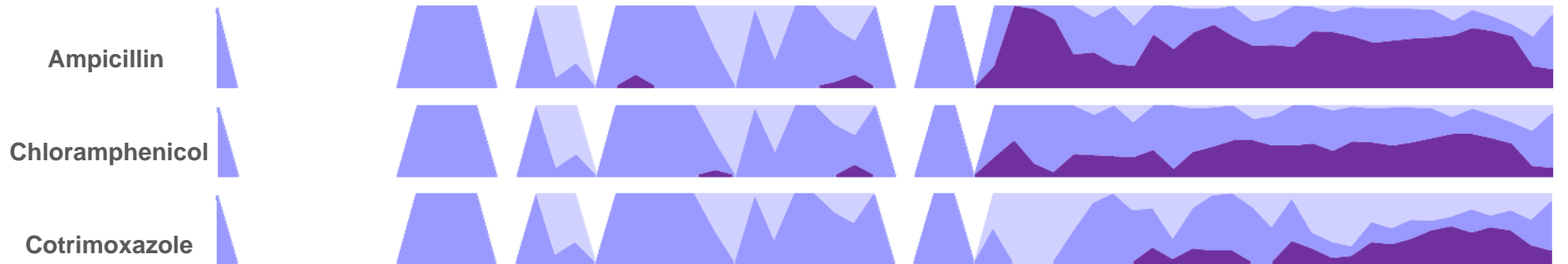
Human Source



Number of Isolates



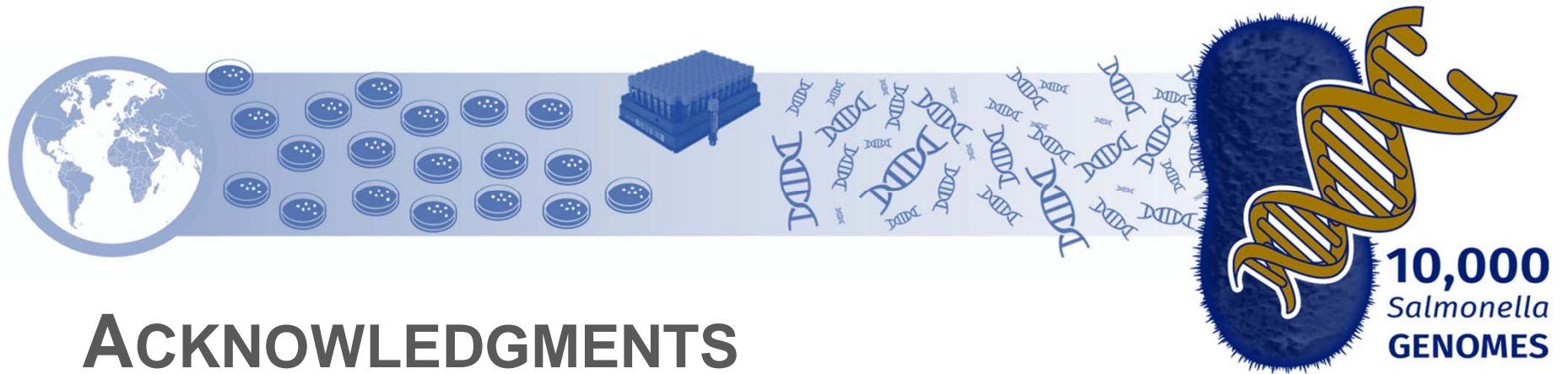
Year



- Resistant
- Susceptible
- Unknown
- Blood/CSF
- Other
- Stool/Urine
- Unknown

Caisey Pulford





ACKNOWLEDGMENTS

Supported by
wellcometrust

All our
collaborators!



UNIVERSITY OF
LIVERPOOL

Hinton Lab members
Nick Feasey



Earlham
Institute

Decoding Living Systems

Neil Hall
Ross Low



Global Challenges Research Fund (GCRF)