Increasing Multidrug and Fluoroquinolone Resistance Among *Salmonella* Typhi from Sporadic Outbreaks in Kenya

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Background: Typhoid fever (TF) caused by *Salmonella* Typhi remains a major public health problem in Kenya. A systematic surveillance in in two slum areas in Nairobi, revealed a crude incidence of TF of 247 cases per 100,000 person-years of observation (pyo), with highest rates in children 5–9 years old (596 per 100,000 pyo). Currently over a third of *S*. Typhi isolates are multidrug-resistant (MDR), and show reduced susceptibility to fluoroquinolones; the drugs of choice for treatment of MDR cases. The situation is worrying especially for resource-limited settings where the few remaining effective antimicrobials are either unavailable or too expensive to be afforded by the general public. The main objective of this study was to evaluate the trends in AMR among S. Typhi isolated from patients attending hospitals in Nairobi in the last 5 years.

Methods: We assessed the susceptibility to commonly available antimicrobials of 225 *S*. Typhi isolates from 5 years of study (2009-2014) from sporadic outbreaks in clinics around Nairobi. We used the disk and MIC method to determine antimicrobial resistance patterns and determined genetic basis of resistance by PCR.

Results: *S*. Typhi outbreaks were due to a single haplotype H58, which is the main cause of epidemics in SE Asia. Over last 5 years only 17.9% were fully sensitive. The majority (60.5%) were multiply resistant to commonly available drugs - ampicillin, chloramphenicol, tetracycline (MICs > 256µg/ml) and co-trimoxazole (MIC > 32µg/ml). Nalidixic resistance was observed in 10% in 2009 to 18% in 2014 of isolates while resistance to ciprofloxacin susceptibility increased from 5% to 10% in 2014.

Conclusion: The rate of increase in MDR over the last 5 years is worrying as more *S*. Typhi become less susceptible to fluoroquinolones. Improved hygiene and sanitation and use of WHO-recommended vaccines should be considered for effective management of MDR TF.