

## Earliest Evidence of Multidrug Antibiotic Resistant Non-Typhoidal *Salmonella* spp. (iNTS) in Uganda: Findings from Clinical Specimens at Makerere University Clinical Microbiology Laboratory

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**Background:** Invasive non-typhoidal *Salmonella* (iNTS) is an emerging blood-stream infection. Prevalence of iNTS is high in settings with high HIV, malnutrition and malaria burden. It is also likely a contributor to emerging antibiotic resistance. In Uganda, the Ministry of Health has paid attention to typhoid surveillance, however little attention has been placed on surveillance of other *Salmonella* subtypes; therefore the burden of iNTS is unknown. As such, the incidence and the extent of antibiotic resistance of iNTS infections could be under-reported despite concomitant high prevalence of the risk factors. In this study we established the prevalence of iNTS and the associated antibiotic-resistance among the clinical specimens collected at Makerere University Clinical Microbiology laboratory.

**Methods:** We analyzed data from all clinical specimens collected at Makerere University Clinical Microbiology laboratory between August 2012 and July 2016. We extracted sample results that were positive for *Salmonella* spp. and further analyzed for the various serotypes and drug resistance.

**Results:** Of 2,784 specimens, 2.1% (59/2784) were positive for *Salmonella* spp. Of the specimens that were positive: 41% (24/59) were typhoidal species, 17% (10/59) were iNTS and 42% (25/59) were not serotyped. All the iNTS were isolated from blood. Drug resistance was highest for Ampicillin; 68% among typhoidal species, 77.7% among iNTS and 30% untyped *Salmonella* spp. This was followed by co-trimoxazole, chloramphenicol and nalidixic acid. Of the iNTS, 70% were resistant to two or more antibiotics.

**Conclusion:** A high prevalence of iNTS is recorded. A majority of the samples positive for iNTS were resistant to commonly used antibiotics underscoring an emerging public health phenomenon. A big proportion of non-serotyped *Salmonella* spp. may represent an underestimation of iNTS prevalence in this study. We recommend sentinel iNTS surveillance to monitor resistance patterns and incidence trends.