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Investigation of an outbreak of Typhoid fever in three schools in Malosa District, southern Malawi, using environmental sampling and novel serology.

Background

Starting in June 2016 a rapid increase in incidence of Typhoid fever centred around three residential schools, including a nursing college, was noted in Malosa region, southern Malawi. We report a description of the outbreak together with the public health response, which included environmental sampling and serological survey.

Methods

A suspected case of typhoid fever was defined as unexplained onset of fever, plus at least one of headache, abdominal pain, diarrhoea, or vomiting, with a negative malaria rapid-diagnostic test. Blood cultures were taken from a sample of patients fitting the case definition. Environmental samples of the gravity-fed water source supplying the institutions, together with tap-supplies and stool from food-handlers were taken. Samples were analysed for the presence of *Salmonella* spp. using standard culture. Anti-Vi antibody testing will be performed, along with a combination of other novel antigens at 3 and 6 months' post outbreak. Participants with high titres will have microbiological screening of stool to investigate the relationship with bacterial stool shedding.

Results

245 cases, were recorded during the outbreak in a population estimated at 1200, suggesting an attack rate of 19.5%. There was one recorded death. *Salmonella* Typhi was confirmed in blood cultures of five cases. Environmental sampling did not identify *S. typhi* but non-Typhoidal *Salmonella* was grown from the chlorinated water supply. Data from serological sampling will be available in February.

Conclusion

This outbreak of Typhoid fever, with high attack-rate in a well-circumscribed cohort has enabled investigation into the potential source of infection as well as novel serological sampling to determine rates of exposure and chronic carriage. We highlight the need for rapid case-identification, treatment, source-control and enhanced diagnostics in this setting.

