**Reviewer’s report**

**Title:** Characterization of Salmonella enterica from invasive bloodstream infections and water sources in rural Ghana

**Version: 0 Date:** 26 Sep 2017

**Reviewer:** Samuel Kariuki

**Reviewer’s report:**

Abstract

Spell check heterogeneity (Results)

Conclusion spell check

Background

Lots of typographical / spelling errors

Methods

Typos errors eg how to write enzyme names! Xba1

See correct expression

PFGE is a rather broad non-specific typing method useful only for epidemic strain typing. In serovars such as Salmonella spp the differentiation between strains is non epidemic outbreak situation may be due to single one to 3 SNP changes. Those are only detectable by genome sequencing not PFGE. In addition authors only investigated water as possible source of NTS transmission/ infection for humans while water is an important source and vehicle of NTS transmission (and indeed many other enterics). The main source of NTS especially in developed countries has been livestock derived products- these were not tested!

To conclude that human to human transmission could not be a factor in their study, a more thorough analysis of fecally derived and bloodstream NTS strains should be undertaken, especially at WGS level so that SNP can be well detected and used for phylogenetic analysis of relatedness of strains.

In addition, the finding of diverse strains from patients (unless in ongoing epidemic) may not lead to a firm conclusion that human to human transmission is not a factor. This has been seen for genomically diverse (SNPs) in S.Typhi outbreaks over time.

Water samples were collected over a relatively short period of time (Oct-Dec2009) to make any sensible epidemiologic conclusion on disease transmission or reservoir status.
Previous studies on NTS epidemiology clearly show prevalence is higher during the rainy session, possibly due to enhanced transmission due to increased water contamination. Sampling should therefore cover both raining and dry spells. At the serovar level, the isolates from water sources were different from those from human sources, this has clearly been shown before and confirms the unlikely major role of water reservoirs as sources of NTS infections.

This study looked at very few environmental samples (water in this case) to make a strong conclusion regarding non-environmental source of transmission of iNTS infections.

Conclusion

The findings are clearly overstated especially in a light of the fact that WGS was not used to study the geo-phylogeny of stains studied from bloodstream infections. The study should therefore simply report on findings of bloodstream NTS infections, but transmission hypothesis cannot be proved using the current present data.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
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