Author's response to reviews

Title: Emergence of New Leptospiral Serovars in American Samoa - Ascertainment or Ecological Change?

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Author's response to reviews: see over
Reviewer’s report #1

Title: Emergence of new Leptospiral serovars in American Samoa - Ascertainment or Ecological Change?

Version: 1 Date: 27 September 2011
Reviewer: Scott Carver
Reviewer’s report:
All comments are Major Compulsory Revisions

Please see our responses in blue:

This study reports a large sero-survey for leptospiral serovars in American Samoa, comparing the results of this survey with a previous study, reporting novel serovars, and evaluating potential drivers of leptospiral emergence. The authors have made a commendable effort in what is surely challenging working conditions and achieved some very interesting results. Significant revisions need to be made to the writing of this manuscript to bring it up to standard, particularly the abstract, introduction and discussion. I strongly encourage the authors to make the necessary revisions, to what is otherwise a very good study.

General comments
Much of the written issues with this manuscript arise from the need for a logical structure and flow of information and adequate treatment of the literature. For example, the introduction is far too brief and the discussion is quite disjointed.

Abstract:
No mention is made of the 2004 study to which this survey is compared. This is a fundamental part of your study’s conclusions and the abstract should reflect that.
Manuscript amended

Delete “secondary” from the last sentence of the Methods.
Manuscript amended

In what way did the geographic distribution in serovars differ between islands?
Amended to read: “The serovars differed in geographic distribution, with variations in seroprevalence between islands and different ecological zones within the main island.”

What does this mean?
Under conclusions, amended to read: “Variations in geographic distribution of serovars suggest that environmental factors play an important role in disease transmission and emergence. Possibilities include changes in interactions between humans and the environment; introduction of serovars through transport of animals; evolution in distribution and/or abundance of animal reservoirs; and environmental changes that favour transmission of new serovars.”
The term “disease ecology is in transition” is not really a meaningful statement. It would be more correct to say something like “pathogen dynamics are in a state of transition.”

We agree that this statement is confusing, and have removed it from the manuscript.

Introduction:
The introduction would be greatly improved by providing more background on leptospiral ecology, pathology and epidemiology, backed up by examples. A background on leptospiral serovars is also needed, as well as a history of Leptospirosis in American Samoa to justify the importance of this study. Furthermore, the authors should introduce the 2004 study with which they compare their results and give a statement of the studies hypothesis. The introduction has been expanded significantly to include background information on microbiology, ecology, pathology, epidemiology, and emergence. A brief summary of the 2004 study has been included.

Methods:
Why were the behavioural risk factors left as “unpublished data”? Are they to be published in another manuscript? If so, say so.

We apologise for not making it clear that the main findings of our seroprevalence study in 2010 are discussed in another different paper [1]. It has recently been accepted for publication in the American Journal of Tropical Medicine and Hygiene, and should be available online very soon. A final proof of the paper is available on request. A summary of the main findings have been included in the introduction, and we have referenced the paper for more detailed information on our methods and results, including behavioural risk factors for infection. In the paper being reviewed here, we focused on the emergence of serovars and discuss the epidemiological and ecological implications of our findings.

Results:
It is important to guide the reader as to what the important results are, and their subsequent significance. For example, describe how “seroprevalence differed between islands and how serovars varied in their geographic distribution”. What are the important patterns/differences here?

Manuscript amended to include a detail description of the findings.

The results in Table 2 are not at all mentioned. These results need to be described.

Manuscript amended, and results from all tables are discussed in the manuscript.

This study could be improved by adding some simple analyses, such as a logistic regression of how the probability of having leptospiral antibodies is related to location or local population density.
Additional statistical analyses (Chi-squared tests and logistic regression) have been performed to explore differences in seroprevalence between islands, population density, and vegetation type (from newly available geo-referenced data).

Discussion:
The discussion could be improved by having a good solid structure. As it currently stands the discussion is disjointed and reads like a jumble of information. Furthermore, the discussion could be improved by a more careful interpretation of the results in light of other studies.
A good way to begin your discussion is to re-state the main objectives of your study and the main findings.
Much of the first paragraph should be in the results, not discussion.
“...disease ecology is in transition...” is not a meaningful term. See comments in abstract.
Paragraph 2. The relative merits of each of your potential explanations needs to be justified. Could there be other explanations? Are some more explanations more realistic than others? If so, why or why not? Devote significant attention to these explanations in your discussion.
Paragraph 3. Wouldn’t it be more likely that human exposure related to the interaction with reservoirs?
As a general rule, you shouldn’t cite tables and figures in your discussion.
Paragraph 4. The first two sentences of this paragraph is a good example of how your results could be written in a more meaningful way.
Paragraphs 3 and 5. When you are talking about the ecological niche of the serovars, I think you are getting confused with the ecological niche of the host. It would be more correct to say that the ecological niche of the serovars is the host, and the host(s) of these serovars exist in various ecological niches across the islands. This distinction is important and should be discussed.
Final paragraph. A citation is needed to justify the first sentence.

The discussion has been completely restructured and rewritten. Thanks for the very helpful comments.

Additional suggestions:

Level of interest: An article of outstanding merit and interest in its field
Quality of written English: Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests:
'I declare that I have no competing interests'

Reviewer's report #2

Title: Emergence of new Leptospiral serovars in American Samoa - Ascertainment or Ecological Change?
Version: 1 Date: 26 October 2011
Reviewer: Stephen McGarvey

Reviewer's report:
Major Compulsory Revisions
1. The basic questions addressed in the report are well defined, and pertain to a descriptive exploration of leptospiral serovars in American Samoa. However, the background section is too brief and does not serve the curious non-specialist. The second sentence in the Background needs more details including some estimates of leptospirosis' prevalence to support the statement that it is the most common bacterial zoonosis. This will allow readers to compare it to others. In addition please be specific about the WHO global regions where its recent emergence has been reported. It would be helpful to simply name the nations or regions in which the specific contexts listed occurred. Again more detail about the variation in specific animal hosts is welcome here along with some summary information about any evidence for variation in efficiencies or adaptedness to different animal hosts.

1. The introduction has been expanded significantly to include background information on microbiology, ecology, pathology, epidemiology, and emergence. A brief summary of the 2004 study has been included.

2. The methods do not describe the participation proportion from the recruitment. This is needed.
3. The information on occupation, especially farming, and potential contact with non-human animals is missing. The increase in piggeries has been a concern in American Samoa and any reports about leptospirosis must include some information about proximity of participants to piggeries and their potential role in human infection. Since there are data on behavioral risks not presented here, their distributions should be described as well as their associations with odds of leptospirosis and its serovars.

2 & 3. We apologise for not making it clear that the main findings of our seroprevalence study in 2010 were discussed in another paper [1]. It has recently been accepted for publication in the American Journal of Tropical Medicine and Hygiene, and should be available online very soon. A final proof of
the paper is available on request.

A summary of the main findings of the study have been included in the introduction, and we have referenced the paper for more detailed information on our methods and results, including behavioural risk factors for infection, and environmental risk factors such as location and density of piggeries around participants’ homes. In the paper being reviewed here, we focused on the emergence of serovars and discuss the epidemiological and ecological implications of our findings.

4. Since part of the findings involves a comparison to earlier unpublished work from American Samoa, please make some brief mention of that in the Background before the purpose statement.
A summary of the 2004 study has been included in the introduction

5. In Results there is no test of whether the variation in seroprevalence between islands is significant or meaningful. The confidence intervals for the prevalence should be included in Table 1.

6. Since the results indicate new serovars in the 2010 survey compared to the 2004 survey, it is incumbent on the authors to use all available data, such as the unpublished demographic and behavioral risk and perhaps microspatial ecological data such as proximity to streams or piggeries, animal contacts and husbandry data, to help explain this evident emergence. Does human or animal population density data exist to help their search for explanations? Without these attempts to explain the serovars or the emergence of new ones to more specific ecological or socio-demographic factors the report is very descriptive.

5 & 6. Results on behavioural and environmental risk factors were discussed in our recent paper [1]. For this paper, additional statistical analyses (Chi-squared tests and logistic regression) have been performed to explore differences in seroprevalence between islands, population density, and vegetation type (from newly available geo-referenced data). Confidence intervals have been included in all tables.

- Minor Essential Revisions
1. In the Methods description about taking the highest titre serovar as the positive serovar, there should be a citation to support this procedure and decision.
Reference included

2. In the Discussion the seroprevalence for the unpublished 2004 survey are compared to the current data, but there is no description of the sampling distribution used in the 2004 survey.
Manuscript has been amended to read: “Adults were randomly selected from 13 villages on the main island of Tutuila…..”
- Discretionary Revisions None

Recommendation to Editor
Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest
Quality of written English - acceptable
Statistical review – additional statistical methods are needed to help evaluate statements made. If the authors revise then a statistical review can be done, along with the assessment of this reviewer’s competence to do so.
Declaration of competing interests - I declare that I have no competing interests.
Open peer review – I understand that this review will be posted on the BMC Infectious Diseases website.