

Author's response to reviews

Title: Autoregression as a means of assessing the strength of seasonality in a time series

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Dr. Colin Mathers
Editor, Population Health Metrics

Re: Manuscript #188524911216748
Autoregression as a means of assessing the strength of seasonality in a time series

Dear Dr. Mathers,

Thank you very much for your comments and attention to this manuscript. We are delighted that you think that with revisions it would be acceptable for publication. The two reviewers identified a few issues for further discussion and clarification. I will address each of these in this letter.

To begin, we would like to thank the two peer reviewers for their critical reading of the manuscript.

Kenji Shibuya's comments:

1. The adequacy of order 2 for the autoregression model. We did simulation experiments for different values for k , the order of the autoregressive model, and concluded that k did not change significantly. Thus AR(2) was good enough to replicate the process (see Table 1 below). This has also been addressed on page 8 of the manuscript.
2. Stationarity of the real data sets. We conducted unit root analysis (Dickey-Fuller unit root test) to assess the stationarity of the real data sets as suggested by the reviewer. Results showed that the asthma data was stationary and the first order differencing adequately transformed the atrial fibrillation data to a stationary series. The analyses of the real data sets have been revised accordingly in the results section of the manuscript (see pages 8 and 9).

Ajay Tandon's comments

1. The robustness of the k . The robustness of the k is demonstrated through simulation experiments as suggested by the reviewer. From the simulation results we concluded that the k is robust to over fitting of the data and it did not systematically increase with the increase of the order. All simulation results are included below (Table 1) and are discussed in the manuscript on page 8.

2. The relationship between stepwise method selection and R^2 . A stepwise method for selecting the order of the autoregressive model was employed in a simulation experiment. The simulation results showed that relative to fixed (small to moderate) orders of the autoregressive model, the stepwise method does not significantly affect the R^2 . Results were however slightly more conservative (see Table 1 below). We then employed the stepwise method in the analysis of the real data sets which led us to the same conclusions as with the fixed AR(2) method. This is discussed on pages 8 and 9 of the manuscript.

In conclusion, we thank the peer reviewers and the editors for their attention to this manuscript. We believe that we have answered every call for revision and that the resubmitted manuscript is substantially improved as a result of this peer review process.

We look forward to hearing from you in the near future and hope that the move to acceptance to publication will proceed subsequently.

Sincerely yours,

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