Reviewer’s report

Title: Applying cusum-based methods for the detection of outbreaks of Ross River virus disease in Western Australia

Version: 1 Date: 11 April 2008

Reviewer: Ben Cowling

Reviewer’s report:

This manuscript describes the use of a negative binomial cusum algorithm for automated surveillance of Ross River virus. The methods should be generalisable to other diseases. The provision of R code in the appendix is a good idea. I think the paper will be an excellent contribution to the literature, and I have two major comments which should be straightforward to resolve, and a few minor comments for the authors.

Major revisions

1. The comparison of methods based on specificity, sensitivity and timeliness (or the latter two for a fixed specificity) is good. But it could be improved if measures of sensitivity and timeliness were combined. There are various ways to do this, for example see this article:


Or the authors may propose another way to combine sensitivity and timeliness into a single measure, which should then allow easier comparison. This may also allow you to resolve the apparent paradox of EARS having poorer sensitivity but earlier time to detection.

2. A plot of the data should really be included, and the authors could consider whether some or all of the information in table 1 could be better shown as part of that figure, allowing table 1 to be removed and perhaps briefly summarised in the text. A suggestion for the figure is (above) a time series plot with outbreak periods shown somehow, and (below) a cusum chart. It might not be necessary to show all the data in this figure - perhaps a couple of years could be illustrated in the main text, and the full data shown in the appendix?

Discretionary revisions

1. Abstract - results - the first sentence may be revised based on a single measure of model performance

2. The manuscript might be improved by more extensive citations of the existing literature on disease surveillance and particularly the use of cusum and quality control methods in this setting. Some examples are given below, and medline/google scholar searches of "cusum disease surveillance" produce many
hits of which at least some must be relevant and worth citing:

Do CuSums have a role in routine communicable disease surveillance? SJ O'Brien, P Christie

A monitoring system for detecting aberrations in public health surveillance reports.
GD Williamson, G Weatherby Hudson

Methods for monitoring influenza surveillance data. BJ Cowling, IOL Wong, LM Ho, S Riley, GM Leung

Evaluation and extension of the cusum technique with an application to Salmonella surveillance. TE Carpenter

**Level of interest:** An article whose findings are important to those with closely related research interests

**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