Reviewer's report

Title: Re-emerging syphilis: a detrended correspondence analysis of the behaviour of HIV positive and negative gay men

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Reviewer: Mark Hill

Level of interest: A paper of considerable general medical or scientific interest

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The authors are correct in supposing that detrended correspondence analysis (DCA) is a suitable method of analysis for their data. However, there is insufficient information about the variables that went into the analysis. It is clearly of interest to know that some individuals with risky behaviour were uninfected, but the analysis needs to be sharpened up a bit.

1. On page 5, there is a list of rejected variables, but the reader wants to know which variables were actually used.

2. It would be useful to have a diagram showing where the attributes came in the ordination. The DCA ought to show which variables were on the right side of the diagram (risky behaviour) and which on the left (relatively safe behaviour). Likewise, there may possibly be some interest in Axis 2, which is neither used nor interpreted.

3. The method of selecting the threshold of Axis 1 score 45 is not given. The authors assume that Axis 1 provides a discriminant function, but do not justify the value of 45. There are standard methods of choosing thresholds to maximize the discrimination of two groups.

4. If you are wanting to make the discrimination, it looks in fact as if Axis 2 also contributes information. On the right of the diagram, low Axis 2 values look to me to be more infected than high Axis 2 values. Perhaps you might consider looking for a simple discriminant function, which would be (a) a linear combination of Axes 1 and 2, and (b) which maximizes the discrimination between infected and uninfected individuals. The role of DCA would then be to combine the rather difficult categorical variables into linear combinations that can more readily be used in discriminant function analysis.

Competing interests:
None declared.