Reviewer's report

Title: Methicillin-resistant Staphylococcus aureus and Acinetobacter baumannii on computer interface surfaces of hospital wards and association with clinical infections

Version: 1 Date: 23 April 2009

Reviewer: John H Kalbfleisch

Reviewer's report:

This review addresses mainly the statistical aspects of the manuscript.

Major Compulsory Revisions

(1)
Statistical analyses and presentations in the manuscript need revision. In this study the sampling unit is the computer (N = 282). A mouse/keyboard pair belong to each computer. The authors need to report results (infection or positivity rates) on the N = 282 basis. In the current paper, the authors use N = 564; this assumes the keyboard and mouse devices are independent (as if from 564 different computers). Analyses and report presentations must correctly reflect the study design. One solution would be for the authors to define “computer +” if at least one of (keyboard, mouse) is “+” (for a chosen pathogen, or for any pathogen assayed). Then, the impact of hospital descriptors (location, function) can be analyzed and reported on a “computer unit” basis. (also see 3 below).

(2)
The authors (incorrectly) use a independent sample Chi-square test procedure to compare the keyboard infection rate with the mouse infection rate. Since each computer has a keyboard and mouse observation, the appropriate statistical method is the “paired sample” version of the Chi-Square (usually labeled the McNemar test procedure). The authors will need to enumerate (and report in the manuscript) the number of computers that were (a) “pathogen +” for both keyboard and mouse, (b) “pathogen +” for only the keyboard, (c) “pathogen +” for only the mouse. The remaining number of computers would be only computers negative on both the keyboard and mouse. There will be no difficulty finding a reference or source for this paired-design test. Since there were more “+” keyboard cases than “+” mouse cases, readers will want to know if the “+” mouse computer was also “+” for the keyboard (this is absent in the manuscript).

Minor Essential Revisions

(3)
Since there are two or more descriptor variables (location and function in table 1), the authors should consider multiple logisitic regression (Y = 0 or 1 for computer not infected or infected) to test the effect of the predictors in the
presence of each other. The manuscript can report results of univariate testing and/or multiple variate testing in a table.

(4) Small frequency counts in contingency tables have been traditionally viewed as problematic for the usual Chi-Square analysis (a concern of a reviewer). Since the contingency tables in this study do have small frequencies the authors should consider performing a statistical test that is an exact probability calculation - in lieu of the approximate Chi-square method used. There are also exact statistical methods (software) for multiple logistic regression. In either analysis class (approximate or exact), the computer is still the study sampling unit (N = 282).

(5) Although assumed, the authors need to clearly state whether every computer had both the mouse and keyboard assayed. If not, statistical analyses need adjustment for this imbalance feature.

(6) SPSS and SAS are different software packages. Clarify the last paragraph in the Methods Section (page 8). Also, p<0.05 is considered statistically significant.

(7) The authors might provide a better description of “compliance rate” (page 9, how is it defined or computed).

Discretionary Revisions

(8) The aforementioned revision of statistical analyses of computer pathogen positivity rates and the impact of hospital predictors can be performed for (a) any pathogen, or (b)each pathogen of interest (current manuscript). Table data should report infection frequency counts, the corresponding infection rate and the level of significance for rate comparisons of interest.

(9) Figure 2 needs a better explanation. Many readers will not know how to interpret this figure, especially since it mixes computer units that were “+” with patient-case-isolates.

(10) Just to check, did any keyboard (or mouse) have more than one species isolate? (I think only 5 computers produced multiple species).

(11) Although not a study aim, some readers might be curious about computer infection levels during nosocomial outbreaks in the hospital (possibly material for discussion).
**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'

John H. Kalbfleisch, Ph.D.