Reviewer's report

Title: What potential could there be for a S. aureus vaccine in a hospital setting on top of other preventative measures? A model-based analysis.

Version: 3  Date: 2 December 2013

Reviewer: Leigh Anne Shafer

Reviewer's report:

The authors have responded well to previous suggestions. Specifically, their description of the model is much better now. Some additional comments remain:

Major

1. What is the basis on which you decided to model that 10% of daily admissions were among colonized patients? (Give a ref?)

2. One of the nice aspects of your model is the ability to simultaneously model HA-MRSA and CA-MRSA, both with different infection duration, infectiousness, colonization duration, etc. However, Figure 1 suggests that the model does not allow dual colonization or dual infection with both CA and HA. This would be a limitation. Please update your model description if dual infection is possible, or discuss the limitation in the Discussion if it is not possible.

Minor

1. In the Introduction, most of your evidence suggests a positive impact of Bundle prevention strategies against MRSA, you do also report one study that did not show the positive impact. Also, as you know, negative result studies are more difficult to publish than positive result studies, thus suggesting that there may be others that have not shown the positive impact of MRSA. I would therefore suggest that you modify your statement, starting, “Although bundle measures have proved efficient…” You could just change it slightly, such as, “Although the bulk of the evidence suggests that bundle measures are efficient…”

2. Describing your model as state-of-the-art is over-board. You need to tell us what is state-of-the-art about it. Including vaccination compartments is not state of the art. Your model seems quite ordinary. (It is a fine model, but seems quite ordinary.)

3. In discussion, it should be mentioned that your estimates are likely maximum additional efficacy of the potential vaccine. In your models, you assumed 100% bed occupancy at all times, which is likely untrue, and would maximize the number of infections averted by the vaccine.

4. Figure 3 is very nice. However, this statement in your results, describing the table, needs to be corrected: “In each of the plots shown, the baseline parameters were similar (i.e. same level of hygiene compliance, same screening compliance and decolonization efficacy).” In fact, hygiene compliance varies in
each plot, so the statement needs to be corrected.

5. The two left panels of Figure 4 were a good way to present your data. I did not understand the two right panels. It seems to be saying that as hygiene compliance rises, the annual number of vaccine doses also rises – which doesn’t make sense.

**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.