Reviewer's report

Title: Development and validation of a bedside risk score for MRSA among patients hospitalized with complicated skin and skin structure infections

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Reviewer: Frank Lowy

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The manuscript by Zilberberg et al., describes the development of a scoring system to assess the likelihood of patients hospitalized with a cSSSI having the infection due to MRSA rather than no-MRSA. The authors use data retrospectively collected from a US database (HealthFacts medical record database) of 62 hospitals. Subjects were identified based on the use of ICD-9 codes. The sample size included 7183 patients with 33.2% of these having MRSA infections. The authors then identify and validate a scoring system that utilizes race, diabetes, malignancy renal disease and cardiac dysrhythmias as the simple scoring criteria. The manuscript is clearly written; the statistics well described and appropriate and the authors acknowledge and discuss the strength and limitations of their investigation. The tables and figures are useful.

There are a number of questions concerning the manuscript.

1. The nature of the hospitals contributing to the database should be more fully described. It is not clear whether they are representative of US hospitals or more accurately reflect a subset – perhaps more community-based institutions. This would create some selection bias in the nature of the cSSSI admitted to hospital and might explain some of the more confusing variables that appeared to be different between the two groups.

2. Isolates are described as non-MRSA. Typically they are listed as MSSA. Is there a reason for the use of the term non-MRSA?

3. The results are a bit counter intuitive with some factors that are usually identified with MRSA infections being more commonly associated with the non-MRSA infections. This includes such variables as admission from a noncritical care facility, immunosuppression, ESRD, recent admission, etc. All of these have been associated with an increased risk of MRSA infections, perhaps not cSSSI but the authors should comment on this observation. In addition the length of stay for the non-MRSA infections was also longer than for the MRSA infections. This again raises the question of the nature of the study population.

4. The vast majority of cSSSI are not admitted to hospital so this group appears to be a select subset of patients with these infections who warrant admission. Among these are patients with polymicrobial infections, not generally included in this type of analysis. How many of these were there?

5. It is difficult to imagine when this bedside score would be used. Perhaps the authors can elaborate on this. In most hospital settings the patient is assessed in
the emergency department, any collection drained, empiric antibiotics initiated and the patient is sent to the floor. Patients are empirically treated based on knowledge of the antimicrobial susceptibility of the isolates in the community. If necessary therapy is adjusted once the antimicrobial susceptibility of the isolate becomes available. What percent error rate would the authors find acceptable to apply their scorecard in the ED? Most physicians would likely prefer to cover for both MSSA and MRSA especially in those patients with infections serious enough to warrant hospitalization and then adjust therapy.

6. An additional concern regarding this type of analysis, also noted by the authors, is the lack of strain typing. A recognized feature of epidemic clones such as USA300 is the propensity for these strains to lose the SCCmec element while retaining virulence. The risks for a cSSSI infection would likely remain the same but the antibiotic susceptibility would differ.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I have no competing interests regarding this manuscript.