Reviewer’s report

Title: Residential care homes for elderly are more important than hospitals in the transmission of methicillin-resistant Staphylococcus aureus

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Reviewer: Jon P Furuno

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Cheng et al describe the results of a study to “investigate the acquisition of MRSA in residential care homes for the elderly (RCHE) and hospitals” within a healthcare system in Hong Kong to inform regarding the relative contributions of each facility type on the transmission of MRSA in the system. While this is a worthwhile aim, unfortunately, the study is confusing as written and lacks specificity regarding most of the study methodology. As such, the resulting data as well as potential strengths and limitations of the study are difficult to know and understand.

Major Compulsory Revisions:

The study design is very difficult to understand. It is not clear when following admission “admission cultures were collected” and when prior to discharge, “discharge cultures were collected. It is not clear how the “subgroups” were chosen, why the exposure windows of 12 months were chosen, and if any patients left the healthcare system alive (i.e. discharged home, moved to a new geographic area, etc) and were lost to follow-up.

Minor Essential Revisions:

The authors introduce a number of terms e.g. colonization-days as the denominator incidence if transmission (abstract) and comparative analysis (introduction) which are neither clear nor defined. In addition, the reported “incidence” of MRSA carriage in the introduction should likely be the “prevalence” carriage.

Methods:

Are the extended-care hospitals 1600 beds each or 1600 beds combined between the three?

The authors used a number of atypical abbreviations (e.g. CGAT, HKWC, RCHE), which make the paper difficult to read. Rather than RCHE, the authors should consider LTCFs for long-term-care facilities, which is common term familiar to most readers.

Residents of long-term care facilities are notoriously difficult to collect informed consent from. It is not clear what proportion agreed to participate and whether those excluded for this study were different than those included?
Were all hospital patients discharged to the RCHE or extended-care facilities? None were discharged home, another acute care hospital, etc?

The authors should be more descriptive regarding the source of the patient data. Currently, it just says it was “retrieved,” but all data sources and methods of collection have there strengths and weaknesses.

By selecting the subgroup patients in 1) hospitals without exposure to RCHE and 2) RCHE without exposures to hospitals, how representative do they think their results will be?

The use of resident's living area is atypical and may be highly specific to the study setting. It is also not clear to me how this would serve as a proxy for the “hygienic standard” of the RCHE and what exactly is meant by hygienic standard. While the square footage was validated, what was not validated was the variable that is being approximated.

The statistical analysis section is brief and it is clear that there was specific hypothesis addressed in this study. In addition, all measures of effect are bivariable and there is no statistical adjustment to adjust for potential confounders.

Results:

Were there any differences between the RCHE that participated and those that did not? Also, there are no data on those who consented and those who refused and any differences between them.

The term “rate” is used incorrectly. Rates are events per units time.

Were the subgroup patients “selected” or where all patients lacking the necessary exposure included?

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

**Quality of written English:** Not suitable for publication unless extensively edited

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

**Declaration of competing interests:**

I declare that I have no competing interests