Reviewer's report

Title: A latent class approach for sepsis diagnosis supports use of procalcitonin in the emergency room

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Reviewer: Corey E Ventetuolo

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The study by Jaimes and colleagues utilizes latent class modeling to determine the diagnostic accuracy of three biomarkers (CRP, DDimer, and procalcitonin) to identify sepsis in patients presenting to the emergency department at a single center, as compared to expert adjudication.

# The authors refer to the study as “Prospective…cross-sectional”. This statement needs to be revised to accurately reflect the study design.

# While using LCA as an analytical approach may be unique, the findings are not particularly novel.

# Some discussion of the validity (or lack there-of) of the individual biomarkers selected and why these three markers specifically were chosen needs to be included. With the exception of procalcitonin, CRP and Ddimer have not been individually validated in bacterial infection and/or sepsis, and so it is not surprising they would perform poorly even when combined. While the authors provide some discussion of the prior literature on PCT, no explanation is offered about the lack of agreement between their identified cut-points and those previously published.

# The diagnostic “gold standard” utilized here, clinical expertise, performed poorly (65% agreement among cases). While the author’s acknowledge the lack of more powerful diagnostic tools in sepsis, this needs to be identified as a weakness.

Level of interest: An article of limited interest

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

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