Reviewer's report

**Title:** Determination of decimal reduction time (D value) of sanitary agents in hospital usage.

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**Reviewer:** Gerald McDonnell

**Level of interest:** A paper of limited interest

**Advice on publication:** Unable to decide on acceptance or rejection until the authors have responded to the compulsory revisions

I wish to thank the authors and editors for the opportunity to review the paper submitted to BMC Infectious Diseases by Mazzola et al on the Determination of decimal reduction time (D value) of sanitary agents in hospital usage. My overall conclusion was that with some editing this paper should be accepted for publication in BMC Infectious Diseases, if the following issues can be addressed:

a) Discretionary revisions

Abstract

-Results: although spore-forming organisms are used in the test we have no understanding of how many spores, as opposed to vegetative forms, are present in the test suspensions.

Background

-The authors define disinfection and sterilization in this section. These definitions should be consistent with international guidelines; the authors are referred to references provided in the document and to ISO standards to be consistent. It would also be helpful to define ‘sanitizer’ as this is well used in the document.

Methods

-There is not sufficient information to review the techniques used in the study. In particular:

-the microbiological culturing methods should be provided in more detail (for example, how ‘spore’ suspensions were cultured with media, times of incubation etc)
-how were at least 12 logs of bacteria cultured and tested; this is indeed challenging
-for the range of biocides tested, further information should be provided on the neutralization techniques employed

Results and Discussion
-Confirm formatting; their appears to be two sections

-Security level: A 12 log reduction is not sufficient to indicate a 'sterilization process'. It is suggested that discussion of 'sterilization' be removed in the document. Refer to ISO 14937 for further information on the requirements for sterilization processes. Some of the actives tested, in particular, are well known to be non-sporicidal and therefore can not be even considered as 'sterilizing'. A six log reduction can indicate the effectiveness of a disinfection process, but the test methods employed do not consider surface disinfection, as suspension testing; this should be discussed.

-Use of 'cleansing program' in the text is unclear. Cleaning should be considered a separate process to disinfection/sterilization, as the authors correctly review in the introduction but appears to be misleading in the results/discussion section.

-Chlorhexidine: Like other liquid biocides, the activity of the biocide will vary depending on the formulation. If specific products containing chlorhexidine, formaldehyde, and glutaraldehyde are used these should be listed. The log reductions observed for spore-forming bacteria are indicative of activity against vegetative forms of these bacteria in suspension, as chlorhexidine in not sporicidal; this should be clarified in the report. These products are generally only used for skin treatment as antiseptics.

-Formaldehyde: Reference to scrapie prions should be reworded. This seems out of context and is inaccurate.

-Conclusion: The written conclusions do not reflect the purpose of the study, which was to test disinfectants to confirm efficacy in a hospital environment, presumably due to varying use of products and their claims. Authors should again clarify their use of 'sanitizing' as opposed to 'disinfection'

b) Compulsory revisions

-Although suspension, or D-value testing can be a useful and easy to conduct technique, it should be made clear that this method is only indicative of the efficacy of a product and the authors should stress the need for standard surface testing to be conducted to demonstrate efficacy of sanitizers, disinfectants and/or sterilants. This data should be provided by product manufacturers to ensure efficacy on surfaces, which will vary considerably depending on the challenge surface. D-value testing may be used to verify efficacy under actual use conditions or against specific hospital pathogens that are a concern.

-A review of the grammar and spelling should be made in the whole document.

-Authors should focus on the recommendation to confirm the effectiveness of biocides used in the hospital against key pathogens in the facility, to conform to Brazilian requirements; as brief review of these requirement may be helpful to the reader.

Competing interests:

None declared.