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Comparative Life Cycle Assessment Between Single-Use and Reprocessed IPC Sleeves [Response to Letter]

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Dear editor

We thank Dr Fikri for their careful reading of our research and their interest in the environmental impact of healthcare. Overall, we agree with the points raised. We see these, however, more as extensions of the life cycle assessment (LCA) we undertook as compared to corrections.

Every LCA must define its goals and scope (Phase 1 according to the ISO-standard). The goal of our research was to quantify the environmental impact for one distinct market, and in our case the scope was limited to the United States as reprocessing is currently only undertaken in this country. Although, an extension of the analysis to other geographic regions was out of scope for our analysis, we agree that this could provide additional value. Potentially one could identify countries where reprocessing under the current scenario could also result in environmental gains.

We agree that the results depend on the region chosen, yet the more global the approach, the more general the assumptions taken will be. This then leads to higher uncertainty in the results, and potentially fewer actionable insights that can be gained. Every LCA needs to work with assumptions as it is rarely the case that the full range of required inputs for a product system is known. The important part is to highlight the assumptions and discuss the limitations they might carry. In this context, we performed sensitivity analysis and found that the results are relatively stable when varying transport distances (see Supplementary material).

We developed a very specific transportation model that deals with numerous hospitals, several distribution centres and contains distances and specific means of transport across the US. The model is supplemented with chosen datasets for means of transport from Ecoinvent 3.0. However, Figure 1 only presents a simplified version of the model as presenting the whole model was out of scope for this paper.

Due to the strong focus on climate change in the public discourse we limited the content of Figure 4 to this impact category. This impact category was deemed to be more relevant to the audience of this journal, which is focused on trends in healthcare policy and management and not necessarily on the LCA method itself. However, a comparison of the normalized results for 16 impact categories are presented in in Figure 2 and Figure 3.

We appreciate the feedback on our analysis and support further research in the area of medical device reprocessing as we share the vision that this field will become evermore important in the coming years.

Disclosure

Rhodri Saunders is the founding director and owner of Coreva Scientific GmbH & Co. KG, which received consultancy fees from Cardinal Health for performing, analyzing, and communicating the work presented here. Francesca Paolini is an employee of Coreva Scientific GmbH & Co. KG, which received consultancy fees from Cardinal Health for performing, analyzing, and communicating the work presented here. Markus Meissner is an associate member of the

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