**Author’s response to reviews**

**Title:** The German Quality Network Sepsis: study protocol for the evaluation of a quality collaborative on decreasing sepsis-related mortality in a quasi-experimental difference-in-differences design

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**Author’s response to reviews:**

We want to thank the Editor for the helpful comments that supported us in improving the study protocol. Page numbers and lines given in our answers refer to the tracked version of the manuscript.

Editor a) We note that no mention of the evaluation design (i.e. a quasi-experimental evaluation using a difference-in-differences design) is made in the title or abstract. To aid future searching please amend to include this in both the title and abstract.

Answer a) we included the study design both in the title as well as in the methods section of the Abstract (p. 3, l. 21). We also included the term “quasi-experimental” in the methods section of the manuscript (p. 16, l. 7).

Editor b) Although you state that the manuscript takes into account the SQUIRE 2.0 recommendations, key aspects (items 8-10) are not yet sufficiently well reported to be considered further. These include sufficient detail on:

1. What the quality improvement collaborative actually entails that others could reproduce the essential ingredients
2. How you aim to capture its fidelity (whether the QIC is delivered as intended) and dose (the quantity of QI delivered)

3. How you will establish whether the observed outcomes were due to quality improvement collaborative

Answer b) We changed part of the headings in the methods section, moved parts of the text and included additional information to more closely correspond to the SQIRE guideline. Beside some minor corrections we did the following changes:

- The heading “context” was included at the beginning of the methods section (p. 7, l. 2)
- The heading “measurements and interventions” was changed to “interventions” (p. 10, l. 8)
- The heading “study of the interventions” was included (p. 16, l. 3)
- The description of the design of the evaluation was moved to the new subsection “study of the interventions” to describe the approach for studying the interventions (p. 16, l. 4-7).
- Descriptions regarding process measures were moved to follow the new heading “Measures for studying process and implementation of interventions” (p. 16, l. 18 – p. 17, l. 16)
- The heading “outcome measures” was included and the description of the primary outcome was moved there (p. 17., l. 17-21)
- A sentence was included regarding the accuracy and completeness of data (SQUIRE 10.c) (p. 17, l. 21-24)
- The paragraph on the project status was moved to the end of the methods section (p. 21, l. 7-18)

Regarding Editor’s point 1:

We included an additional paragraph, which lists the interventions, to help clarifying which are the essential ingredients (p. 10, l. 9-11). We also provide additional information regarding which interventions are mandatory for participation in the quality collaborative and what is in the responsibility of the central study coordination bureau and what is in the responsibility of the participating hospitals (p. 10, l. 12 to p. 11, l. 6).
Regarding Editor’s point 2:

We moved our description of the process evaluation to the section “study of interventions” and now give more detail on these measures (p. 16., l. 18 to p. 17, l. 16).

Regarding Editor’s point 3:

We included information that explains how our evaluation design and analyses try to establish that changes in the outcome are due to the intervention. The risk-adjusted difference-in-differences comparison corrects for two major possible sources of bias in quality improvement efforts: secular changes as well as the so called “Will Rogers phenomenon” (p. 16, l. 8-15). We also explain that our analyses aim at evaluating the overall effect of participating in the quality collaborative, but that they will not be able to attribute effects to individual intervention elements (p. 16, l. 15-17).

Editor c) Please complete (as far as you can as its a protocol) and upload a copy of the SQUIRE checklist.

Answer c) We upload a completed copy of the SQIRE checklist along with the revised manuscript.

Editor d) Implementation Science only considers protocols which have been through competitive external peer review by a nationally recognized research agency and will therefore usually only undergo editorial peer review by the handling editor. As such, documentary proof of both ethics and funding are required, and we recommend that authors upload the relevant documentation on submission. I should also stress that we do not make these documents publicly available upon publication of the manuscript.

Answer d) We uploaded the respective documents (ethics approval, data protection approval, proof of funding) along with the revised manuscript.