PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Resilience in Healthcare (RiH) - A Longitudinal Research Program Protocol
AUTHORS	Aase, Karina; Guise, Veslemøy; Billett, Stephen; Sollid, Stephen; Njå, Ove; Røise, Olav; Manser, Tanja; Anderson, Janet; Wiig, Siri

VERSION 1 – REVIEW

REVIEWER	Zhe He Florida State University, USA
REVIEW RETURNED	07-Apr-2020

GENERAL COMMENTS	This protocol paper presents a program called Resilience in Healthcare (RiH) consisting of a comprehensive research program that models the capacity of healthcare systems and stakeholders to adapt to changes, variations, and/or disruptions. I think given this COVID-19 crisis, this project is of great importance to evaluate whether and how healthcare systems can adapt to the surge of patient flow to the system due to the wide spread of the virus while still delivering high quality care to patients with a variety of problems of different levels of seriousness. This promising five-year study will be conducted in multiple countries around the world, which is ideally for this. It is based on a sound resilience theory. The integrated work packages are well designed and sound. Each of the 5 WPs has its own research question, work tasks, and validation plan. It also has a well thought of dissemination plan and ethic consideration. I have a few suggestions: 1. To improve the clarity of this protocol. I hope the authors could give more details about the resilience theory. What does it constitute? Why can it be applied to the healthcare setting? 2.The authors could also make the outcomes of this program more explicit. 3.What is the timeline of this project? How about the timeline for 5 WPs?

REVIEWER	Jody Hoffer Gittell Brandeis University, United States
REVIEW RETURNED	25-Apr-2020

GENERAL COMMENTS	1. The authors make a strong case for the limitations of previous methods for studying health outcomes, particularly that these methods fail to capture the system of factors that together produce health outcomes. This limitation is particularly problematic for

	understanding adaptive capability of health systems over time, also known as resilience. 2. A strength of the research protocol is a design that makes health systems the unit of analysis and enables researchers to track health systems over time to observe how they respond to various changes. Given that many elements of health systems involve national policies and contexts, it is appropriate that researchers propose to use a cross-national design with multiple sites in one country (Norway), and a broader comparison with five other countries. It is also a strength that they begin with an exploratory phase then move into an intervention phase. 3. The dissemination plan is a strength, with a combination of traditional and non-traditional outlets to reach both researchers and practitioners. The translation of findings into practice through co-construction between researchers and practitioners is another strength. 4. The authors argue that resilience in healthcare has been studied only in small scale individual case studies. This point is questionable. There have been multi-site quantitative studies of resilience in healthcare, for example by Sutcliffe and Vogus, and by Gittell. I would agree that these multi-site quantitative survey-based studies do not have nearly the depth of the multi-site longitudinal qualitative study being proposed here, but still they should not be overlooked entirely. 5. The authors make a good case for resilience as a key capability underlying health quality outcomes, and they argue that this is due to the complexity of health systems. The authors also identify gaps in current theories of resilience, pointing out that they do not integrate sufficiently across multiple levels of the system or across multiple stakeholders in the system. There is some very good work behind the RIH framework, and its multi-level, multi-stakeholder approach is a tremendous strength. I question however whether the study design and the RIH framework have given sufficient attention to the role of that relationships play in resilience, in particular high-quality role relationships between providers (relational coordination), between providers, patients and families (relational coproduction), between providers and leaders (relational leadership), and across distinct components of the healthcare system. I also question whether there is sufficient attention to how structures and policies can be designed to either strengthen or weaken these strategically important relationships. For example, protocols and checklists are not sufficient to create a resilient system, as the authors suggest, but shared protocols are part of a system that supports the development of resilient relationships across components of that system. To learn more about the role that high quality role relationships play in achieving resilience and how organizations can be structured to support those relationship, I would recommend work by Sutcliffe, Vogus, and Gittell. This work is by no means comprehensive or conclusive, but it is a foundation upon which to build, and it suggests important directions for continued work that is well aligned with the contributions this study is aiming to make. 6. The study is multi-national but is there sufficient basis for comparison given that the focus is primarily Norway?

	Two smaller points: 7. PSI is clearly an important construct in this research protocol, but I was not able to find easily what it means in the text. Perhaps when you use it after several sections of not mentioning it, you can reintroduce the full term to prevent the need to read from the start to find out what it means. 8. I like the visual of the research program that is provided, and I would also like to see a visual of the RIH model that the authors are proposing as a foundation for this research.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1
This protocol paper presents a program called Resilience in Healthcare (RiH) consisting of a comprehensive research program that models the capacity of healthcare systems and stakeholders to adapt to changes, variations, and/or disruptions. I think given this COVID-19 crisis, this project is of great importance to evaluate whether and how healthcare systems can adapt to the surge of patient flow to the system due to the wide spread of the virus while still delivering high quality care to patients with a variety of problems of different levels of seriousness. This promising five-year study will be conducted in multiple countries around the world, which is ideally for this. It is based on a sound resilience theory. The integrated work packages are well designed and sound. Each of the 5 WPs has its own research question, work tasks, and validation plan. It also has a well thought of dissemination plan and ethic consideration.

Response:
Thank you, we sincerely appreciate your positive feedback.

1. To improve the clarity of this protocol. I hope the authors could give more details about the resilience theory. What does it constitute? Why can it be applied to the healthcare setting?

Response:
Resilience theory is constituted by diverse and multi-disciplinary research fields. Therefore, we have published a separate debate paper on the boundaries and operational concepts of resilience applied in our research program (Wiig et al 2020, BMC Health Services Research). We have included a paragraph on the grounding of our theoretical approach in resilience theory and referenced the debate paper (see third paragraph of the introduction section, page 3).

2.The authors could also make the outcomes of this program more explicit.

Response:
Thank you for raising this important issue. We have included sub-headings and information on outcomes in the details of each WP (see work package descriptions, page 7-11).

3.What is the timeline of this project? How about the timeline for 5 WPs?

Response:
Thank you for pinpointing this omission, we have included the project period in the methods section, as well as the timeline of the five WPs (see third paragraph of the methods section, page 6-7).

Reviewer 2

1.
The authors make a strong case for the limitations of previous methods for studying health outcomes, particularly that these methods fail to capture the system of factors that together produce health outcomes. This limitation is particularly problematic for understanding adaptive capability of health systems over time, also known as resilience.

Response:
Thank you for acknowledging our description of the research challenges related to the understanding of adaptive capacity and resilience in healthcare.

2.
A strength of the research protocol is a design that makes health systems the unit of analysis and enables researchers to track health systems over time to observe how they respond to various changes. Given that many elements of health systems involve national policies and contexts, it is appropriate that researchers propose to use a cross-national design with multiple sites in one country (Norway), and a broader comparison with five other countries. It is also a strength that they begin with an exploratory phase then move into an intervention phase.

Response:
Thank you for acknowledging the design of our research program including the multi-component, multi-level, and longitudinal aspects.

3.
The dissemination plan is a strength, with a combination of traditional and non-traditional outlets to reach both researchers and practitioners. The translation of findings into practice through co-construction between researchers and practitioners is another strength.

Response:
Thank you for acknowledging our dissemination plan.

4.
The authors argue that resilience in healthcare has been studied only in small scale individual case studies. This point is questionable. There have been multi-site quantitative studies of resilience in healthcare, for example by Sutcliffe and Vogus, and by Gittell. I would agree that these multi-site quantitative survey-based studies do not have nearly the depth of the multi-site longitudinal qualitative study being proposed here, but still they should not be overlooked entirely.

Response:
Even though we already included one Sutcliffe and Vogus reference in our manuscript (reference no. 2), we appreciate the referral to these multi-site survey-based studies of resilience in healthcare and have included them in the introduction section (see second paragraph, page 3 and third paragraph, page 4).

5.
The authors make a good case for resilience as a key capability underlying health quality outcomes, and they argue that this is due to the complexity of health systems. The authors also identify gaps in

current theories of resilience, pointing out that they do not integrate sufficiently across multiple levels of the system or across multiple stakeholders in the system. There is some very good work behind the RIH framework, and its multi-level, multi-stakeholder approach is a tremendous strength. I question however whether the study design and the RIH framework have given sufficient attention to the role of that relationships play in resilience, in particular high-quality role relationships between providers (relational coordination), between providers, patients and families (relational coproduction), between providers and leaders (relational leadership), and across distinct components of the healthcare system. I also question whether there is sufficient attention to how structures and policies can be designed to either strengthen or weaken these strategically important relationships. For example, protocols and checklists are not sufficient to create a resilient system, as the authors suggest, but shared protocols are part of a system that supports the development of resilient relationships across components of that system. To learn more about the role that high quality role relationships play in achieving resilience and how organizations can be structured to support those relationship, I would recommend work by Sutcliffe, Vogus, and Gittell. This work is by no means comprehensive or conclusive, but it is a foundation upon which to build, and it suggests important directions for continued work that is well aligned with the contributions this study is aiming to make.

Response:
We appreciate the suggestion to focus our design and framework more on a relationship approach according to the works of Sutcliffe, Vogus, and Gittell, and we agree with the reviewer that resilient relationships among stakeholders and system units play an important role in resilience in healthcare. Our intention has been to cover these issues in WP4 on collaborative learning. Here we build on an interactive, participatory, and reflexive approach including the arguments that the reviewer make, yet we have not used the relationship concept. We have therefore chosen to stick with the collaborative learning concept in WP4 but have included a sentence with reference to the relationship-focused approach (see first paragraph in WP4 description, page 10). In addition, we have in the international WP5 description outlined our team-based approach where we study how teams communicate and co-ordinate to adapt and respond to challenges and problems, much in common with the relationship framework (see first paragraph in WP5 description, page 11).

6.
The study is multi-national but is there sufficient basis for comparison given that the focus is primarily Norway?

Response:
Thank you for raising this issue. The multi-national study in WP5 will include data collection in five countries besides Norway to allow cross-country comparison. A separate protocol is under publication for the international study. We have clarified the basis for comparison in the description of WP5 (see first paragraph in WP5 description, page 11).

7.
PSI is clearly an important construct in this research protocol, but I was not able to find easily what it means in the text. Perhaps when you use it after several sections of not mentioning it, you can reintroduce the full term to prevent the need to read from the start to find out what it means.

Response:
We agree that the PSI abbreviation might appear as odd and hinders the readability of the manuscript. We have therefore chosen to write out in full, patient and stakeholder involvement throughout the manuscript, except for in the WP2 description which covers PSI in detail (see changes throughout the manuscript).

8.

I like the visual of the research program that is provided, and I would also like to see a visual of the RIH model that the authors are proposing as a foundation for this research.
Response:
Thank you for acknowledging our figure of the RiH research program. A model or models of the RiH theoretical framework planned in WP1 will be part of our results and may as such not be reported in the protocol.

VERSION 2 – REVIEW

REVIEWER	Zhe He Florida State University, USA
REVIEW RETURNED	16-Aug-2020

GENERAL COMMENTS	I think the authors have adequately addressed all the comments of the reviewers.

REVIEWER	Jody Hoffer Gittell Brandeis University, USA
REVIEW RETURNED	29-Aug-2020

GENERAL COMMENTS	Second Review (see new comments in bold) 1. The authors make a strong case for the limitations of previous methods for studying health outcomes, particularly that these methods fail to capture the system of factors that together produce health outcomes. This limitation is particularly problematic for understanding adaptive capability of health systems over time, also known as resilience. 2. A strength of the research protocol is a design that makes health systems the unit of analysis and enables researchers to track health systems over time to observe how they respond to various changes. Given that many elements of health systems involve national policies and contexts, it is appropriate that researchers propose to use a cross-national design with multiple sites in one country (Norway), and a broader comparison with five other countries. It is also a strength that they begin with an exploratory phase then move into an intervention phase. 3. The dissemination plan is a strength, with a combination of traditional and non-traditional outlets to reach both researchers and practitioners. The translation of findings into practice through co-construction between researchers and practitioners is another strength. 4. The authors argue that resilience in healthcare has been studied only in small scale individual case studies. This point is questionable. There have been multi-site quantitative studies of resilience in healthcare, for example by Sutcliffe and Vogus, and by Gittell. I would agree that these/ multi-site quantitative survey-based studies do not have nearly the depth of the multi-site longitudinal qualitative study being proposed here, but still they should not be overlooked entirely.

	I appreciate that the authors have revised the protocol to account for this critique. They have added a sentence saying: “These capacities are currently explored and partially acknowledged in the healthcare sector, but have to date been limited to small-scale individual case studies, with a few notable exceptions.” They then cite a Gittell study and a Vogus study, but do not say anything about these studies, in what way they are an exception, and what can be learned from them. However they have added another paragraph which seems helpful: “Resilience in healthcare as conceptualized above is rooted in resilience theory. Resilience is primarily a guiding concept represented in different ways in theories from diverse scientific disciplines. Engineering and human resources perspectives seek to understand and strengthen how people adapt and build adaptive capacity into technological systems or organisations. Psychological perspectives focus on individual psychological capacities to cope with adversity and is often linked to vulnerable groups. Ecological perspectives focus on how biological systems facing unpredictable changes adapt to cope with these and maintain system stability. Societal perspectives seek to understand and plan responses to and recovery from large scale disasters to preserve system stability and infrastructure. These diverse theories and models about adapting to problems, changes and adversity have informed health services research, including resilient healthcare. As such, resilience in healthcare is a growing research field that seeks to understand and improve system functioning from institutional, work systems and personal perspectives to deliver high quality care and safe patient care.” 5. The authors make a good case for resilience as a key capability underlying health quality outcomes, and they argue that this is due to the complexity of health systems. The authors also identify gaps in current theories of resilience, pointing out that they do not integrate sufficiently across multiple levels of the system or across multiple stakeholders in the system. There is some very good work behind the RIH framework, and its multi-level, multi-stakeholder approach is a tremendous strength. I question however whether the study design and the RIH framework have given sufficient attention to the role of that relationships play in resilience, in particular high-quality role relationships between providers (relational coordination), between providers, patients and families (relational coproduction), between providers and leaders (relational leadership), and across distinct components of the healthcare system. I also question whether there is sufficient attention to how structures and policies can be designed to either strengthen or weaken these strategically important relationships. For example, protocols and checklists are not sufficient to create a resilient system, as the authors suggest, but shared protocols are part of a system that supports the development of resilient relationships across components of that system. To learn more about the role that high quality role relationships play in achieving resilience and how organizations can be structured to support those relationships, I would recommend work by Sutcliffe, Vogus, and Gittell. This work is by no means comprehensive or

	conclusive, but it is a foundation upon which to build, and it suggests important directions for continued work that is well aligned with the contributions this study is aiming to make. The authors have added: “In developing the framework, adjacent conceptual approaches will be consulted, e.g. relationship-based approaches.” These approaches are explained a bit more in the new paragraph noted above, so I am OK on this point. 6. The study is multi-national but is there sufficient basis for comparison given that the focus is primarily Norway? The authors are now clearer about how the cross-country comparison will work. Two smaller points: 7. PSI is clearly an important construct in this research protocol, but I was not able to find easily what it means in the text. Perhaps when you use it after several sections of not mentioning it, you can reintroduce the full term to prevent the need to read from the start to find out what it means. I now see that PSI means patient and stakeholder involvement – which is a highly relational construct. The central role of PSI in this study means that there is in fact a strong attention to relationships – now the authors can state as well that high quality relationships have been theorized, and found, to be predictors of resilience. 8. I like the visual of the research program that is provided, and I would also like to see a visual of the RIH model that the authors are proposing as a foundation for this research. I still don’t see a visual of the RIH causal model, just the same model of the research program.