Author’s response to reviews

Title: Exploring factors associated with the uneven utilization of telemedicine in Norway: a mixed methods study

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Author’s response to reviews:

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Mr. Dirk Krüger
Editor
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Re: Revision of the manuscript "Exploring factors associated with the uneven utilization of telemedicine in Norway: a mixed methods study” (MIDM-D-17-00273)

Dear Editor,

We are pleased to submit the revised version of the manuscript mentioned above (reference: MIDM-D-17-00273). We would like to thank the experts and the editorial staff for their pertinent and constructive comments.

We carefully considered all the experts' comments.

We hope that this revised version of the manuscript is now suitable for publication.
Respectfully,

On behalf of the authors

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Reviewer reports

Maurice Mars (Reviewer 1)

Thank you for the opportunity to review this interesting paper exploring factors associated with the uneven use of telemedicine in Norway. The paper updates the data presented in 'Adoption of routine telemedicine in Norwegian hospitals: progress over 5 years' by Zanaboni P and Wootton R, BMC Health Services Research 2016:16:496, with additional data for 2014 and 2015, and new information from interviews with key stakeholders. The methods are appropriate, although as the authors acknowledge, their interview sample was small.

ANSWER: We sincerely thank Reviewer 1 for the comprehensive review of this manuscript and the very useful comments. We did try our best to address those concerns and integrate them into a new revised version of the manuscript. We are pleased to read that the methods we used in this mixed methods study were appropriate. At the same time we acknowledge some limitations to this study, including the limited number of interviews. However, saturation was reached with the stakeholders included in this study.

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While having given a broad definition of telemedicine in the introduction the authors have for the purpose of the paper then used a stipulative definition in the methods, which includes only telemedicine by videoconference. Other forms of telemedicine are not remunerated and thus not recorded in the national registry used as the data source and thus not reported in this paper. There are several papers reporting telemedicine activities in Norway that are not videoconference based even if they are research based or pilot projects and this is identified as a limitation of the study. Mention of other non-videoconference based telemedicine services would help to put the findings of the paper in perspective.
ANSWER: We recognize also the following limitation: “quantitative data are related to use of videoconferencing only. As a consequence, other types of telemedicine (e.g. store-and-forward) were not covered. “

In this study we decided to use high-quality and accurate data based on a unique national database. If it is true that telemedicine activities covered by this database include only telemedicine by videoconference, it is also true that these are the only data which provide a nationwide, comprehensive and detailed picture of the use of routine telemedicine in Norway.

As suggested, we now mention other store-and-forward services in the manuscript, such as: “A number of store-and-forward telemedicine services have been used in Norwegian hospitals, such as teledermatology offered by means of still image referral, telepathology and telecardiology for home monitoring of patients with implantable cardioverter defibrillator and pacemaker (14,19).”

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Norway was a global leader in telemedicine in terms of early adoption and enabling regulation, such as remuneration for both store and forward and videoconferenced telemedicine. Store and forward remuneration was apparently withdrawn in 2008, although not mentioned in this paper. Unfortunately, time appears to have stood still and use of telemedicine (videoconferencing) is regressing according to this report - although this may not be completely correct as there may be informal and other store and forward and mobile health based services. No mention is made of any discussions or plans to re-introduce remuneration and thus record keeping for store and forward telemedicine and other mobile phone based store and forward services in Norway. What impact will the Norwegian eHealth strategy have on telemedicine and store and forward telemedicine in particular and what of the effects or potential effect of the various EU eHealth directives and strategies? Surely they include store and forward telemedicine and different forms of mHealth.

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ANSWER: As suggested, we have now introduced a sentence where we provide more information regarding reimbursement for store-and-forward telemedicine: “Despite Norway introduced the first reimbursement for telemedicine in 1996 for use of both store-and-forward and videoconferencing solutions in specialized care, reimbursement for store-and-forward telemedicine was discontinued in 2008 [17]. Probably as a consequence, most services in routine use today occur via videoconferencing.”

We have also integrated additional comments regarding the potential impact of the recent strategy for e-health in Norway as well as EU eHealth directives. “Due to the current changes in strategy and policies for remuneration, it is important to monitor future revisions of reimbursement strategies and evaluate their impact on telemedicine adoption and utilization. The «EU eHealth Action Plan 2012-2020» should also contribute to drive changes in this direction,
particularly in the light of recommendations aimed at implementing coherent policies and strategies to develop citizen/patient-centred care and services [54]. Moreover, new modes of professional health practice (e.g. use of smartphone or tablet to perform a medical consultation or follow-up by a health professional, mobility, work from home) and new the forms of "network-organizations" should be considered in the future remuneration and financing mechanisms.”

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The paper presents an interesting case study of how the visionary approach to telemedicine in Norway in the 1990’s has stagnated because of failure to embrace changes in the field and revisit and revise policies that were initially enabling but which have become stifling and obstructive. The most restrictive policy appears to be remuneration: the GP is required to do all the work in arranging a videoconference consultation and is then not paid for this extra work or the teleconsultation. I don't think that this message of the need to review and revise policy has been adequately made strongly enough in the paper. Successful telemedicine implementation, including sustainability and its scaling-up, are still evolving fields of telemedicine research.

While many call for a facilitating and enabling environment to make telemedicine successful, including remuneration policies, solutions found and used need to be periodically reviewed as technology advances, people's use and approaches to technology change and the ways of conducted telemedicine change. Surely the days of pilot projects and champions should be a thing of the past in Norway and the developing world?

ANSWER: We totally agree with Reviewer 1 with this useful comment on reimbursement. In order to provide more focus on the importance of reimbursement for financial sustainability and scaling up, and the need to update current policies for remuneration, we have now integrated additional text in the discussion section, including: “The recent strategy for e-health in Norway seems to set the basis for a major shift towards nationwide large-scale use of digital health services to citizens and health professionals, including e-health and telemedicine in both specialized healthcare and primary care. An example is the recent introduction of a specific reimbursement for the conduction of (store-and-forward) e-consultations by GPs for patient follow-up. This is the first reimbursement policy to be introduced in Norway in primary care.”

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Paradoxically radiology is reported as being fully integrated in the health system in Norway, and no doubt remunerated, even though it is not videoconference based. How has this anomaly occurred and has it been used to leverage other forms of telemedicine?

ANSWER: Teleradiology is a unique case since the whole radiology has been digitalized with the adoption of RIS/PACS. This means that today there is no distinction between radiology and teleradiology. As a consequence, the term teleradiology is not in use any longer, and what was referred to teleradiology in the past is now part of the routine practice in radiology. Exchange of digital images can occur between small and large healthcare facilities under the same institution,
between different public healthcare institutions, or between public and private institutions. As the other clinical specialties are not fully digitalized, we can only expect a limited number of consultations to be conducted via telemedicine.

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Analysis of telemedicine use and uptake is difficult. This paper reports use by region, site and discipline. Is it possible from the available data to identify the number of telemedicine users per site? A small rural hospital with many active users would be considered an adopter as would a larger hospital with only one or two users. Reporting telemedicine use as a percentage of outpatient visits may be appropriate based on the national data available for this paper but misses important and seldom reported data: papers often report that X% of patients managed through a telemedicine service were saved an unnecessary referral and transfer, but we are not told, as in this paper what percentage of all the patients seen as outpatients were referred for specialist treatment. This would allow better understanding of actual telemedicine use, as use is a function of need.

ANSWER: This is another very useful comment, which we did try to address in the current paper, as well as in previous ones. Unfortunately, such detailed level of information was not available from the data we collected. As a consequence, the highest level of detail we were able to reach is the number of telemedicine consultations by hospital and clinical specialty. As the current study used a mixed methods approach to explore the factors associated with utilization of telemedicine in Norway with the point of view of the healthcare managers and providers, we focused our analyses on available data combined with in-depth interviews with key stakeholders at national, regional and local level. We will definitely consider conducting another study with the aim to analyze telemedicine utilization by active users. Such detailed analyses would imply extensive data collection from each of the hospitals and hospital departments in Norway rather than using centrally available data.

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Overall I found this to be a sad report - a fallen hero. But we must extract all that we can to learn from it, especially for those in the developing world with limited resources who must not make the same mistakes.

ANSWER: As previously mentioned in another comment, “the paper presents an interesting case study of how the visionary approach to telemedicine in Norway in the 1990's has stagnated because of failure to embrace changes in the field and revisit and revise policies that were initially enabling but which have become stifling and obstructive.” The picture emerged from this paper is indeed a bit sad, as Norway has been well known for its early adoption of telemedicine. However, as we know, there are only few countries with such a nationwide telemedicine network, and seldom data on routine utilization of telemedicine are published. As a consequence, there are often expectations that telemedicine services are used at a high extent,
while use in practice is limited. With this manuscript we aim to provide a real picture of how
telemedicine is currently used in Norwegian hospitals, and we hope that similar reports will be
published in other countries. Overall, Norway is still a country offering a nationwide
telemedicine network with a high adoption but still low use. We also believe that the current
changes in strategy and policies will finally result in a larger routine use.

Kavita Radhakrishnan (Reviewer 2)

Thank you for the opportunity to review this paper. The article is a mixed methods study
exploring telemedicine utilization in Norway. The article is generally well-written with
identification and discussion of several important factors pertinent at the clinician and
organizational level. The authors could address patients' or consumers' role on telemedicine
utilization in Norway. Additional suggestions for improvement are as follows.

ANSWER: We sincerely thank Reviewer 2 for the useful feedback on this manuscript. We have
addressed all the comments in the current revised version of the manuscript. As explained below,
this manuscript explores the factors associated with utilization of telemedicine in Norway with
the point of view of the healthcare managers and providers through interviews with key
stakeholders at national, regional and local level. The patient perspective is only indirectly
expressed in the interviews with the stakeholders. However, we agree that patients’ perspective
is important especially for patient-centered services (not covered by this study).

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Introduction:

Page 3, line 22: The sentence - "Regions and hospitals have a relative freedom to plan, organize
and deliver services, in addition to manage investments" needs grammatical revision.

ANSWER: The sentence was changes as follows: “Regions and hospitals have relative freedom
to manage investments and to plan, organize and deliver services”.

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Methods section:

Qualitative coding: Briefly describe methodology of pragmatic thematic analysis especially
towards achieving consensus of the themes.

ANSWER: We have now provided more details on the pragmatic thematic analysis of the
content: “Having not taken a particular conceptual framework for the study, we proceeded in an
inductive-deductive way. This flexibility has made it possible to start from some dimensions that were regularly reported (e.g. professional, organizational, and economic) in the literature [30], while leaving the perspective open to other potential elements that could emerge from the data. Themes were discussed and subsequently validated.”

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Results section:

Page 6, Line 18: The para is confusing. It begins saying that telemedicine activity was higher in regions with lower density, However, it is not clear what the density of western Norway is - high or low. Plus, northern Norway's decrease in teledemed activity contradicts the first statement in that para.

ANSWER: The sentence was changed as follows: “Overall, telemedicine activity was higher in regions characterized by a lower centrality (Table 2). Western Norway was the region using most telemedicine across the whole period. Northern Norway, region characterized by a very low population density (score: 0.20) and peripherality (score: 4), reported consistently use of telemedicine with the exception of a decrease in 2015.”

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Page 8, line 35 - for readers not aware of the Norwegian health system, what does primary care and secondary care mean?

ANSWER: We have now provided better definitions of primary health services and specialized healthcare services in the introduction, which we use consistently in the rest of the manuscript:

“The country is divided into four regional health authorities (Northern, Central, Western, and South-Eastern Norway), which are state enterprises responsible for specialized healthcare services (i.e. hospital care) regionally [7, 8].”

“At the local level, municipalities are responsible for primary health services, including general practice, mental health care, nursing homes, preventive medicine and health promotion.”

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Additional issues to consider for financial sustainability: Was the constant changes required to update telemedicine related devices and tools an issue?

ANSWER: Yes, financial sustainability related to the update of telemedicine systems was an important issue to healthcare providers. For instance: “Telemedicine projects have been mostly supported by internal funding within organizations, and initiatives often promoted by local champions. This makes the sustainability and scaling-up of services difficult once the pilot phase
“is completed.” “However, due to the lack of recurrent funding, telemedicine services risk to be discontinued as the organization alone cannot bear the costs.”

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Were there any issues regarding the usability of the telemedicine related devices and tools for both clinicians and patients?

ANSWER: Usability did not emerged as a main factor affecting utilization in any of the interviews we conducted in this study. This is probably not surprising since users, both health professionals and patients, are often satisfied with the technology, while other factors pointed out in this manuscript seem to affect utilization at a higher degree.

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Also, did patients' perspectives on telehealth affect growth of telemedicine in Norway at all?

ANSWER: The current study included data on telemedicine (defined as the use of videoconferencing to conduct a consultation or examination, establish a diagnosis or provide treatment at distance) initiated from hospital doctors. We therefore decided to explore the factors associated with utilization of telemedicine in Norway with the point of view of the healthcare managers and providers through interviews with key stakeholders at national, regional and local level. The patient perspective is only indirectly expressed in the interviews with the stakeholders. While patients’ perspective is probably less relevant for hospital-based telemedicine, it is more important for patient-centered services (not covered by this study) such as home telemonitoring, m-health, etc.

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Discussion:

Page 11, line 26: sentence needs grammatical revision - “Despite telemedicine in Norway appears like a multispecialty nationwide network of several hospitals, utilization remains overall low and fragmented.

ANSWER: The sentence was changed as follows: “Despite Norway has a nationwide network where telemedicine is adopted in several hospitals and specialties, utilization remains overall low and fragmented.”

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Pg 13, line 26: This is the first instance where store and forward appears - might need explanation for readers uninitiated to telemedicine.
ANSWER: As suggested, we have now introduced the term “store-and-forward” in the introduction:

“There is currently no reimbursement for store-and-forward (not real-time) telemedicine.”