PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Surgery & COVID-19: A rapid scoping review of the impact of the first wave of COVID-19 on surgical services
AUTHORS	O'Rielly, Connor; Ng-Kamstra, Joshua; Kania-Richmond, Ania; Dort, Joseph; White, Jonathan; Robert, Jill; Brindle, Mary; Sauro, Khara

VERSION 1 – REVIEW

REVIEWER	Nepogodiev, Dmitri University of Birmingham
REVIEW RETURNED	10-Oct-2020

GENERAL COMMENTS	This review attempts to cover a very broad range of issues relating both to the impact of pandemics on surgical services and how this might be mitigated. They correctly identify that the impact of a pandemic is context specific; as a result of attempting to cover all types of surgery in all settings, the information the authors present is very diffuse. Rather than attempting to quantify specific impacts, the authors have only briefly listed some of the key domains relevant during pandemics (cancellations, PPE etc) but this has already been identified by numerous previous guidelines and reviews. Unfortunately, this review does not offer any new insights. At this time the surgical community is broadly aware of the issues, and desperately wants to identify evidence based solutions to safely restarting surgery. It would be better to review in detail the evidence underpinning specific changes interventions so as to make practical recommendations on how to improve patient care and outcomes during the pandemic. There is now a huge literature on SARS-CoV-2. There is no benefit at this point in lumping this in with other diseases (ebola, H1N1 etc) which present very different challenges. The literature search was up to early May and therefore only captures the early reports on the impact of the pandemic. Surgical practice has very substantially moved on since then, so this review would need to be updated to be meaningful.

REVIEWER	Bachelet, Vivienne Universidad de Santiago de Chile, Facultad de Ciencias Médicas
REVIEW RETURNED	06-Nov-2020

GENERAL COMMENTS	The authors have done a well-planned and well-conducted

	rapid scoping review following all the standard guidelines for scoping reviews regarding an important problem in COVID times. Having done a few scoping reviews myself, I find this article particularly well-reported and easy to read, without compromising its depth of analysis, although this latter aspect could be improved, as I mention at the end of my review. I commend the authors for providing the protocol, which attests to the well-thought-out process before the search and data extraction and synthesis. I have only a few very minor suggestions/observations. Line 47 of page 5, I would suggest changing the word "as" for "once". This pandemic is still not over. In Study design, you say that you followed the Joanna Briggs and PRISMA methodologies. You also say that you made methodological concessions following references 7 and 8 (WHO, Cochrane, respectively). I think you could be more explicit in the narrative of your methods to what concessions were made in the context of this rapid review. Line 10, page 12, you say the "where" of surgery is described above. ? Is it the countries? Is it the specialities? Unclear. So, the whole sentence lacks clarity. Please be more explicit for clarity purposes. You could also be more explicit in the section where you say that you want this scoping review to become a "living" review. Please comment on how you could achieve this and whether the themes covered in this review would be the only ones covered and which themes you think are lacking in the literature. The sentence (line 33-35 page 8) "surgical services beyond...health emergencies" I did not understand. In Data extraction, I would be interested in knowing which software you used. I suggest that in the Discussion section, you could comment on the knowledge gap more explicitly. While your discussion is correctly stated in general, and you do recognize some knowledge gaps (lack of literature from low-income countries, for example), I think you could give more thought to topics that are not being researched regarding the impact of COVID on health services like surgery. For instance, how COVID has impacted surgeons' workload, burnout, stress, reconversion of surgeons to medical care, more on medical education particularly regarding medical students who are not going to get exposure to surgical practice, the impact on wait times for specific surgeries, strategies to reduce wait times in the after-COVID era, impact on health budgets, and so on. Given that scoping reviews were introduced to explore

	open-ended questions systematically and gauge the state-of-the-art of a public health problem or policy question (as discussed by Arksey and O'Malley in their seminal paper "Scoping Studies: Towards a Methodological Framework", 2005), I think you could add more value to your work by delving more into what research needs your exploratory review reveals. This would give a more focused conclusion to your paper, notwithstanding that it could be published in its present form.

REVIEWER	de Leeuw, Robert VU Amsterdam
REVIEW RETURNED	23-Nov-2020

GENERAL COMMENTS	Thank you for addressing this very relevant topic. Even after the COVID19 crisis has past, it's very well imaginable that a new virus will put us in the same position. Learning as much as we can right now, will prepare us for the future. I would like to applaud your intensive and seemingly complete search strategy. This should be an example for many others. Methods Although your initial data synthesis (random effects model) was not feasible, I still believe a qualitative data synthesis could have been carried out. For example performing a template analysis could provide more insight. Results You describe a "number of themes emerged", but because you do not discuss how you arrived at these themes, and do not provide these details in your methods, I ask the question: why and how did these themes emerge? Could you take us through the steps of this qualitative analysis? You describe 6 domains, again the question: how did you arrive at those domains? You describe three domains because they were most frequently reported. Can you give us insight into how frequently ALL domains were addressed? This gives the reader insight into the relevance and difference of the three mentioned and the three that are not addressed.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Dmitri Nepogodiev
University of Birmingham, UK

This review attempts to cover a very broad range of issues relating both to the impact of pandemics on surgical services and how this might be mitigated. They correctly identify that the impact of a pandemic is context specific; as a result of attempting to cover all

types of surgery in all settings, the information the authors present is very diffuse.
We thank the Reviewer for providing feedback on our manuscript.

Rather than attempting to quantify specific impacts, the authors have only briefly listed some of the key domains relevant during pandemics (cancellations, PPE etc) but this has already been identified by numerous previous guidelines and reviews.
The quantification of the specific impact of COVID-19 on surgical services is important; our group is undertaking studies to this end, as are others on a global scale (for example, CovidSurg). This review, by contrast, reflects back on the early days of the pandemic, examining issues of concern to surgeons and scientists during the pandemic's first wave. Mapping the literature in the present study identifies gaps in the literature and highlights the need for more studies that quantify the specific impact of COVID-19, before the next wave of COVID-19 or future pandemics hits.
To our knowledge, previous reviews and guidelines did not provide a summary of the evidence around health services related to surgical services. For example, a review of surgical guidelines to which a member of team (Ng Kamstra) contributed, did not provide evidence of the response to public health emergencies and the impact on patients, providers or the healthcare system; nor the resumption of surgical services. This review was initially conducted during the early phase of the COVID-19 pandemic, at which time there was not a great deal of evidence on surgical services, except for clinical guidelines.

Unfortunately, this review does not offer any new insights. At this time the surgical community is broadly aware of the issues, and desperately wants to identify evidence based solutions to safely restarting surgery. It would be better to review in detail the evidence underpinning specific changes interventions so as to make practical recommendations on how to improve patient care and outcomes during the pandemic.
We agree that a systematic review of specific policies and interventions would be of interest and importance, but this was beyond the scope of our rapid review.

There is now a huge literature on SARS-CoV-2. There is no benefit at this point in lumping this in with other diseases (ebola, H1N1 etc) which present very different challenges. The literature search was up to early May and therefore only captures the early reports on the impact of the pandemic. Surgical practice has very substantially moved on since then, so this review would need to be updated to be meaningful.
The Reviewer correctly identifies a limitation of our rapid review – the search strategy was run in May and since that time there has been an explosion of evidence on COVID-19. Our group is currently updating this review and we have identified more than 2 times the number of references. To address this limitation, we have added this to our discussion around study limitations and we have changed the title of the manuscript to "Surgery & COVID-19: A rapid scoping review of the impact of the first wave of COVID-19 on surgical services" to better reflect the evidence that was included.

Likewise, some of the temporal language throughout the manuscript has been changed to reflect this alteration to the title and make the "first wave" references more consistent. These changes are highlighted wherever applicable.

Page 19, line 3 to Page 19, line 9: "Also, given that the evidence around the COVID-19 pandemic is growing at an unprecedented rate, we are aware that additional studies have been published since we ran our search strategy, especially around resuming

surgical services. In order to mitigate this limitation, an ongoing effort to pivot this study into a living review is underway to ensure the data presented is up to date. This will involve re-running the MEDLINE, Embase and grey literature search strategies every 2 months in order to incorporate new evidence into the existing manuscript."

Reviewer: 2
Vivienne C. Bachelet
Universidad de Santiago de Chile (USACH), Chile

The authors have done a well-planned and well-conducted rapid scoping review following all the standard guidelines for scoping reviews regarding an important problem in COVID times. Having done a few scoping reviews myself, I find this article particularly well-reported and easy to read, without compromising its depth of analysis, although this latter aspect could be improved, as I mention at the end of my review.
I commend the authors for providing the protocol, which attests to the well-thought-out process before the search and data extraction and synthesis.
I have only a few very minor suggestions/observations.
We thank the Reviewer for dedicating their time to review our manuscript and for providing suggestions to strengthen it.

Line 47 of page 5, I would suggest changing the word "as" for "once". This pandemic is still not over.
We agree with the Reviewer. At the time of writing the number of cases in many places was beginning to slow, thus our optimism on that point, but as stated the pandemic continues, therefore we have corrected the sentence accordingly.

Page 5, line 20 to page 5, line 23: "Lastly, once COVID-19 begins to release its grip on the world and the post-pandemic recovery begins, programs will be tasked with rebuilding the surgical capacity necessary to reschedule and resume the backlog of postponed procedures."

In Study design, you say that you followed the Joanna Briggs and PRISMA methodologies. You also say that you made methodological concessions following references 7 and 8 (WHO, Cochrane, respectively). I think you could be more explicit in the narrative of your methods to what concessions were made in the context of this rapid review.
We thank the Reviewer for providing an opportunity to expand on our methodology. The specific concessions made were the following: After a pilot exercise of 50 abstracts only a 25% random sample of remaining abstracts was reviewed in duplicate, and the limitations on extracting data from studies published in languages not readily translated by the members of our research team. These two points are now listed more clearly in the manuscript.

Page 6, line 17 to page 6, line 21: "Therefore, methodological concessions recommended by the World Health Organization and Cochrane guidance for rapid reviews were made.7 8 Specifically, following a pilot exercise involving triplicate review and consensus for 50 abstracts only a 25% random sample of the remaining abstracts were reviewed in duplicate. Further, while language limitations were not applied to the search, manuscripts not written in English that could not be translated by members of the

research team were not eligible for data extraction, although their references were still included."

These concessions are reiterated in the sections of the text describing each phase of the scoping review:
Page 7, line 21 to page 7, line 22: "Titles and abstracts were reviewed by one of two independent reviewers with a third, independent reviewer screening 25% of randomly selected references in duplicate."

Page 8, line 14 to page 8, line 16: "Studies in any language were eligible, but consistent with rapid review methods, studies not easily translated by authors were excluded from the data synthesis, although citations are still provided."

Line 10, page 12, you say the "where" of surgery is described above. ? Is it the countries? Is it the specialities? Unclear. So, the whole sentence lacks clarity. Please be more explicit for clarity purposes.
We can appreciate that the meaning of this sentence is unclear. The Reviewer was correct in that the "where" was referring to the countries and specialties. We have revised this sentence to clarify the meaning.

Page 12, line 8 to page 12, line 11: "1. Changes to Case Selection and Triage Procedures. The countries and surgical specialties most effected by pandemic-related changes to service delivery are described above; however, the issue of which patients can safely undergo what surgical procedures was also discussed in the included studies."

You could also be more explicit in the section where you say that you want this scoping review to become a "living" review. Please comment on how you could achieve this and whether the themes covered in this review would be the only ones covered and which themes you think are lacking in the literature.
Thank you for allowing us to clarify this important point. The pace at which new evidence on the COVID-19 pandemic is emerging demands frequent, repeated assessment of the literature in order to keep the findings of reviews such as ours, up to date. We have added a sentence clarify and to explain more clearly how this will be achieved.

Page 19, line 5 to page 19, line 9: "In order to mitigate this limitation, an ongoing effort to pivot this study into a living review is underway to ensure the data presented is up to date. This will involve re-running the MEDLINE, Embase and grey literature search strategies every 2 months in order to incorporate new evidence into the existing manuscript."

The sentence (line 33-35 page 8) "surgical services beyond...health emergencies" I did not understand.
We were trying to convey that we excluded studies that described service delivery changes that did not occur during a public health emergency. We have revised to improve clarity.

Page 8, line 16 to page 8, line 20: "Studies were excluded if they described: only urgent interventions arising during a hospital admission (e.g., emergency tracheostomy, caesarean section), settings beyond in-patient acute care (e.g., outpatient clinics including dental clinics), changes to surgical service delivery not made in direct response

to a public health emergency, and healthcare services not specifically related to surgical service."

In Data extraction, I would be interested in knowing which software you used.
Given the labile nature of this scoping review and the outcomes being extracted throughout, we used a standardized form using Microsoft Excel. Our form allowed for consistency in extraction across all articles by having specific headings and subheadings, but also allowed flexibility with the rapid addition of novel columns or criteria when deemed necessary. We used Covidence for title, abstract and full text screening; however, Covidence did not meet our demands for a flexibility data abstraction process. The use of Excel will also facilitate the updating of this review by allowing the inclusion of additional data in the same spreadsheet.

I suggest that in the Discussion section, you could comment on the knowledge gap more explicitly. While your discussion is correctly stated in general, and you do recognize some knowledge gaps (lack of literature from low-income countries, for example), I think you could give more thought to topics that are not being researched regarding the impact of COVID on health services like surgery. For instance, how COVID has impacted surgeons' workload, burnout, stress, reconversion of surgeons to medical care, more on medical education particularly regarding medical students who are not going to get exposure to surgical practice, the impact on wait times for specific surgeries, strategies to reduce wait times in the after-COVID era, impact on health budgets, and so on. Given that scoping reviews were introduced to explore open-ended questions systematically and gauge the state-of-the-art of a public health problem or policy question (as discussed by Arksey and O'Malley in their seminal paper "Scoping Studies: Towards a Methodological Framework", 2005), I think you could add more value to your work by delving more into what research needs your exploratory review reveals. This would give a more focused conclusion to your paper, notwithstanding that it could be published in its present form.
We thank the Reviewer for this constructive and thoughtful feedback regarding the discussion. It is true that impacts of the current pandemic on medical education are likely to go beyond the residents and fellows assessed in the included studies. The manuscript has been adapted to include a mention of his gap in the research, as well as a reference addition to suggest how this impact might be felt in the future.

Page 17, line 11 to page 17, line 20: "The finding that medical training was compromised is particularly important for understanding the downstream and long-term repercussions of the response to public health emergencies; decreases in surgical volumes and clinical hours for trainees could have negative and unintended effects on the future quality and safety of patient care.43 Notably, the impacts of public health emergencies on medical training and education were almost exclusively evaluated for residents and fellows, failing to consider the limited access that current medical undergraduate students continue to encounter when trying to explore surgical specialties. This is unlikely to affect the quality of patient care but may present later in the form of decreased career satisfaction and engagement, both of which have been associated with burnout44."

Reference 44 added: Rao S, Ferris TG, Hidrue MK, et al. Physician Burnout, Engagement and Career Satisfaction in a Large Academic Medical Practice. Clin Med Res 2020;18(1):3-10. doi: 10.3121/cmr.2019.1516 [published Online First: 2020/01/20]"
Additional information was also added in reference to the lack of evidence on practitioner

burnout and stress.

Page 18, line 4 to page 18, line 16: "Included studies did describe consideration of system-level factors like availability of PPE and ORs. However, more patient-centric considerations such as organizing childcare and requesting time away from their job during a pandemic, are needed. Additionally, research suggesting that surgical capacity can be rebuilt with sufficient PPE and OR space may be falling victim to the lack of identified evidence exploring the wellbeing of the surgical workforce. Resolving surgical backlogs by increasing available resources relies on the high functioning of a workforce of surgeons and allied practitioners not overtaken by burnout and stress, something that has not yet been borne out in the COVID-19 research. In other specialties involved with the care of surgical patients, moral distress has seen a marked increase making it reasonable to believe these same emotional impacts will be felt by members or surgical teams globally. Patient perspectives will also play a role in the rebuild; one study reported 14% of surgical patients initiated the cancellation of their surgery,28 which suggests patient readiness for surgery during- and post-COVID-19 should be considered."

We hope that these additions will serve to spark further discussion and research and we thank the Reviewer again for bringing them to light.

Reviewer: 3
Robert de Leeuw
Amsterdam UMC

Thank you for addressing this very relevant topic. Even after the COVID19 crisis has past, it's very well imaginable that a new virus will put us in the same position. Learning as much as we can right now, will prepare us for the future.
I would like to applaud your intensive and seemingly complete search strategy. This should be an example for many others.
We thank the Reviewer for their enthusiasm for our work, for taking the time to review the manuscript and for providing suggestions to strengthen it.

Methods
Although your initial data synthesis (random effects model) was not feasible, I still believe a qualitative data synthesis could have been carried out. For example performing a template analysis could provide more insight.
We appreciate the Reviewer's suggestion regarding analysis. Given that our objective, using scoping review methodology was to identify and map the evidence, as well as to provide a descriptive summary of the findings in reference to our objectives, we believe a narrative summary of the literature was most appropriate. We did not limit inclusion based on study design and as such expected to obtain articles presenting both quantitative and qualitative data, which further makes analysis challenging. Deviating from this approach, we did use some descriptive statistics to describe the evidence and thematic analysis (inductive approach) to summarize some of the qualitative characteristics of the evidence.

We understand the objective as previously written was misleading, which consequently made our analytical approach seem less appropriate. Therefore it has been revised to better reflect scoping review methodology rather than systematic review methodology.

We have also revised the data synthesis section.

Page 6, line 3 to page 6, line 5: "To enable evidence-informed reorganization and resumption of non-urgent surgeries during COVID-19 and for future public health emergencies, we conducted a rapid scoping review to identify and map the available literature."

Page 10, line 10 to page 10, line 15: "Consistent with our objectives and scoping review methodology,12 we did not to perform quantitative analysis, but did use descriptive statistics to summarize quantitative outcomes. We characterized and mapped the available emerging evidence using a narrative approach. We employed inductive thematic analysis, whereby themes were allowed to develop, to aid in characterizing the evidence. Data were synthesized and presented separately for each of the three research questions."

Reference 12 added: "Arksey H, O'Malley L. Scoping studies: towards a methodological framework. International Journal of Social Research Methodology 2005;8(1):19-32. doi: 10.1080/1364557032000119616"

Results
You describe a "number of themes emerged", but because you do not discuss how you arrived at these themes, and do not provide these details in your methods, I ask the question: why and how did these themes emerge? Could you take us through the steps of this qualitative analysis?
You describe 6 domains, again the question: how did you arrive at those domains?
We took an inductive approach to synthesizing the qualitative evidence. When patterns and consistent strategies began to emerge from the evidence, we took an iterative approach to arrive at the domains listed in the manuscript. Specifically, this took place during data extraction (e.g., creation of increasingly specific headers as increasingly homogeneous strategies emerged from the included studies), and these early domains were refined through conversations within the research team. If two domains appeared to be similar, such as PPE supply and PPE training, the two could be discussed and combined if deemed appropriate by the research team thus reducing the number of identified domains to a more palatable number for the reader.

We have expanded our description of our analytic approach. Page 10, line 10 to page 10, line 15: "Consistent with our objectives and scoping review methodology,12 we did not to perform quantitative analysis, but did use descriptive statistics to summarize quantitative outcomes. We characterized and mapped the available emerging evidence using a narrative approach. We employed inductive thematic analysis, whereby themes were allowed to develop, to aid in characterizing the evidence. Data were synthesized and presented separately for each of the three research questions."

You describe three domains because they were most frequently reported. Can you give us insight into how frequently ALL domains were addressed? This gives the reader insight into the relevance and difference of the three mentioned and the three that are not addressed.
We thank the reviewer again for this thoughtful consideration of our methods. As we described above, the primary goal of our review was to provide a narrative summary of the findings in reference to our objectives. This combined with the pace at which the

review needed to be completed required a flexibility and adaptability not afforded to us by formal qualitative analysis methods. This decision is now discussed in the manuscript.

Page 10, line 10 to page 10, line 15: "Consistent with our objectives and scoping review methodology,12 we did not to perform quantitative analysis, but did use descriptive statistics to summarize quantitative outcomes. We characterized and mapped the available emerging evidence using a narrative approach. We employed inductive thematic analysis, whereby themes were allowed to develop, to aid in characterizing the evidence. Data were synthesized and presented separately for each of the three research questions."

VERSION 2 – REVIEW

REVIEWER	Bachelet, Vivienne Universidad de Santiago de Chile, Facultad de Ciencias Médicas
REVIEW RETURNED	19-Jan-2021

GENERAL COMMENTS	The authors have included my suggestions and clarifications have been made.

REVIEWER	de Leeuw, Robert VU Amsterdam
REVIEW RETURNED	26-Jan-2021

GENERAL COMMENTS	Your aim was "to understand how surgical services were reorganized in response to the first wave of COVID-19 and other public health emergencies". But in the methods section you change that into: This review addressed three questions: 1) How have surgical services been reorganized in response to public health emergencies? In your search strategy you use: Ebola, SARS-CoV1, H1N1, MERS. In the results you write: SARS (7.58%, n=10), Ebola (2.27%, n=3), H1N1(1.52%, n=2), and MERS (0.76%, n=1). So is your study about the first wave of COVID-19 or about all public health emergencies? Of all kinds of infections diseases in the COVID period? Why add the SARS, Ebola, etc and not just focus on the effect of COVID? Or if you want a broader perspective, why aim at the "first wave of COVID-19"? My suggestion is to focus on COVID-19 only, since e.g. Ebola will have different challenges. I do not understand your data synthesis section. You write that you will not perform quantitative analysis but only use descriptive statistic. Yet you also employed inductive thematic analysis, which is a quantative analysis usually performed using the appropriate codes and software. I still cannot understand how your themes emerged. Either you only narrate your results and describe what you found, or you perform an analysis and describe the process in a repeatable way. I do not believe that the corrections made, actually answers any of my previous questions. I did not this in the appendices either. My suggestion is not to mention analysis at all and just provide a narrative review. Loose the words theme and thematic analysis, if you did not perform them accordingly.

	The results are readable and well organized, little comments there.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 2
Dr. Vivienne Bachelet, Universidad de Santiago de Chile, Medwave Estudios Limitada

The authors have included my suggestions and clarifications have been made.

Response: We thank the Reviewer for their initial feedback and are glad we were able to address their suggestions.

Reviewer: 3
Dr. Robert de Leeuw, VU Amsterdam

Your aim was "to understand how surgical services were reorganized in response to the first wave of COVID-19 and other public health emergencies". But in the methods section you change that into: This review addressed three questions: 1) How have surgical services been reorganized in response to public health emergencies? In your search strategy you use: Ebola, SARS-CoV1, H1N1, MERS. In the results you write: SARS (7.58%, n=10), Ebola (2.27%, n=3), H1N1(1.52%, n=2), and MERS (0.76%, n=1). So is your study about the first wave of COVID-19 or about all public health emergencies? Of all kinds of infections diseases in the COVID period? Why add the SARS, Ebola, etc and not just focus on the effect of COVID? Or if you want a broader perspective, why aim at the "first wave of COVID-19"? My suggestion is to focus on COVID-19 only, since e.g. Ebola will have different challenges.

Response: We thank the Reviewer for highlighting these inconsistencies. The overarching objective of this study was to provide evidence to inform policies for reorganizing and resuming surgical services during the COVID-19 pandemic, and to do so we sought to understand how surgical services have been reorganized during and following public health emergencies, particularly the first wave of the COVID-19 pandemic, and the consequences of these changes for patients, healthcare providers and healthcare systems. In order to achieve this objective, we had 4 specific research questions - 1) How have surgical services been reorganized in response to public health emergencies? 2) What are the patient-, healthcare provider-, and system-level consequences of reorganizing surgical services? and 3) What approaches were used for resuming surgical services?

At the time the study was conducted there was little to no evidence for the resumption of surgical services during COVID-19, so we chose to include studies that examined other public health emergencies to synthesize evidence for resumption of surgical services.

We have revised the manuscript so the objectives (overarching and objective of this

study) are consistent and to clarify how the research questions directly relate to the objectives of the study:

Abstract, Objectives section: "To understand how surgical services have been reorganized during and following public health emergencies, particularly the first wave of the COVID-19 pandemic, and the consequences of these changes for patients, healthcare providers and healthcare systems."

Page 6, line 3 to Page 6, line 8: "To enable evidence-informed reorganization and resumption of non-urgent surgeries during COVID-19 and for future public health emergencies, we conducted a rapid scoping review to identify and map the available literature. Our objective was to understand how surgical services have been reorganized during and following public health emergencies, particularly the first wave of the COVID-19 pandemic, and the consequences of these changes for patients, healthcare providers and healthcare systems."

Page 6, line 21 to Page 7, line 2: "This review addressed three research questions to achieve our objective: 1) How have surgical services been reorganized in response to public health emergencies, especially the first wave of the COVID-19 pandemic? 2) What are the patient-, healthcare provider-, and system-level consequences of reorganizing surgical services? and 3) What approaches have been used for resuming surgical services?"

If the Reviewer feels strong that our title is misleading, given our eligibility criteria, we would be amenable to changing the title to: "Surgery & pandemics: A rapid scoping review of the impact of public health emergencies on surgical services".

I do not understand your data synthesis section. You write that you will not perform quantitative analysis but only use descriptive statistic. Yet you also employed inductive thematic analysis, which is a quantative analysis usually performed using the appropriate codes and software.

Response: Thank you for the opportunity to clarify our data synthesis methodology. We did not conduct any hypothesis testing, but did indeed present counts (proportions) to help summarize our findings. The majority of our findings were derived through inductive thematic analysis, a qualitative method used to analyze qualitative data by identifying and organizing themes in a data set (Braun & Clarke. 2006. Qualitative Research in Psychology; Nowell, Norris, White & Moules. 2017. Int J Qual Methods). We chose thematic analysis because the data were not collected using a single epistemology or theoretical approach and thematic analysis has been found to be a flexible analytic method (King. 2004. In Cassell & Symon (Eds.), Essential guide to qualitative methods in organizational research (pp. 257–270); Braun & Clarke. 2006. Qualitative Research in Psychology; Nowell, Norris, White & Moules. 2017. Int J Qual Methods). Indeed, thematic analysis can, but is not always completed using pre-existing coding methods (deductive) and software such as NVivo. Because we did not have a theory or model for this study we used an inductive approach whereby the themes were allowed to emerge (opposed to deductive). Nor did we use NVivo because of the nature of the data.

The procedures we followed to produce the themes contained in the manuscript have

been clarified and described further in the revised manuscript, as below:

Page 10, line 11 to Page 10, line 18: "We characterized and mapped the available emerging evidence using inductive thematic analysis. Specifically, two authors (CO, KS) familiarized themselves with the included studies and, throughout the data extraction process, continuously identified and specified recurrent themes emerging from the data. This was a non-linear process that continued until both authors were satisfied that the selected themes represented all important aspects of the evidence. The penultimate themes are presented. Data were synthesized and presented separately for each of the three research questions."

I still cannot understand how your themes emerged. Either you only narrate your results and describe what you found, or you perform an analysis and describe the process in a repeatable way. I do not believe that the corrections made, actually answers any of my previous questions. I did not this in the appendices either. My suggestion is not to mention analysis at all and just provide a narrative review. Loose the words theme and thematic analysis, if you did not perform them accordingly.

Response: We hope that the description we have added in response to your previous concern regarding our analytical approach to generate our themes makes the method for arriving at our findings clearer. We chose not to adopt a narrative approach to analysis because the data were not conducive to such analytical methods; usually the topic of the studies using narrative analysis are stories (Green & Thorogood, Qualitative Methods for Health Research, pg. 241-247).

We believe that presenting the themes in the results section helps map and characterize the evidence identified of our scoping review and provides structure and organization to the results section which may otherwise become disjointed or difficult to follow.

The results are readable and well organized, little comments there.

Response: We thank the Reviewer for taking the time to assess the revised manuscript and for their suggestions.

VERSION 3 – REVIEW

REVIEWER	de Leeuw, Robert VU Amsterdam
REVIEW RETURNED	09-Mar-2021

GENERAL COMMENTS	thank you for your replies and corrections. I still disagree on the way you used the thematic analysis. I am very familiar with Braun and Clarke and there is a way to do it. Braun at al discrobe 6 steps: 1) Familiarizing oneself with the data 2) Generating initial codes 3) Searching for themes 4) Reviewing themes 5) Defining and naming themes and

	6) Producing the report. This contains of phases: data collecting, coding, generating initial themes, reviewing the themes and finally defining and naming them. Themes are conceptualised based on the data. Theme's don't emerge. I really believe that either you follow those steps, or you should not call your methodology a thematic analysis. Here is an example how we used this methodology before (https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-019-1720-x). It's different data, but the methodology is the same. As you can read here Kallio H, Pietila AM, Johnson M, Kangasniemi M: Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. J Adv Nurs 2016, 72(12):2954-2965 and here Braun V, Clarke V: Using thematic analysis in psychology. Qualitative Research in Psychology 2006, 3(2):77-101. Or a more informal source: https://medium.com/usabilitygeek/thematic-analysis-in-hci-57edae583ca9 But I leave it to the editor to decide on this debate. I am a big fan of your paper and would love to see it published. And perhaps this is more a semantic discussion about name calling, because the results will not change.

VERSION 3 – AUTHOR RESPONSE

Reviewer: 3
Dr. Robert de Leeuw, VU Amsterdam

Dear authors,

Thank you for your replies and corrections.

I still disagree on the way you used the thematic analysis. I am very familiar with Braun and Clarke and there is a way to do it. Braun at al discrobe 6 steps:
1) Familiarizing oneself with the data
2) Generating initial codes
3) Searching for themes
4) Reviewing themes
5) Defining and naming themes and
6) Producing the report.

This contains of phases: data collecting, coding, generating initial themes, reviewing the themes and finally defining and naming them. Themes are conceptualised based on the data. Theme's don't emerge.

I really believe that either you follow those steps, or you should not call your methodology a thematic analysis. Here is an example how we used this methodology before (https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-019-1720-x).

It's different data, but the methodology is the same. As you can read here Kallio H, Pietila AM, Johnson M, Kangasniemi M: Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. J Adv Nurs 2016, 72(12):2954-2965 and here Braun V, Clarke V: Using thematic analysis in psychology. Qualitative Research in Psychology 2006, 3(2):77-101. Or a more informal source: https://medium.com/usabilitygeek/thematic-analysis-in-hci-57edae583ca9

But I leave it to the editor to decide on this debate. I am a big fan of your paper and would love to see it published. And perhaps this is more a semantic discussion about name calling, because the results will not change.

RESPONSE: We thank the Reviewer for their thorough review of the thematic analysis to help delineate the methodological decisions. We have changed any mentions of "themes" to "categories" to avoid confusion and have revised our description of our methods from "thematic analysis" to "inductive qualitative approach". Changes are shown highlighted below with associated line numbers for ease of identification:

Page 10, line 11 to Page 10, line 13: "We characterized and mapped the available emerging evidence using an inductive qualitative approach. Specifically, two authors (CO, KS) familiarized themselves with the included studies and, throughout the data extraction process, continuously identified and specified recurrent categories emerging from the data. This was a non-linear process that continued until both authors were satisfied that the selected categories represented all important aspects of the evidence. The penultimate categories are presented. Data were synthesized and presented separately for each of the three research questions."

Page 12, line 1 to Page 12, line 5: "A number of categories emerged from the 108 studies describing reorganization of surgical services. Nearly all studies reported partial, with most reporting full cessation of non-urgent surgeries at their centre, albeit with varying definitions of "non-urgent" (e.g., can be safely postponed for 3 months) and "urgent" (e.g., patient would have adverse outcome if not completed within 7 days)."