OBSTETRICS & GYNECOLOGY

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- Comments from the reviewers and editors (email to author requesting revisions)
- Response from the author (cover letter submitted with revised manuscript)*

**The corresponding author has opted to make this information publicly available.*

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Questions about these materials may be directed to the *Obstetrics & Gynecology* editorial office: obgyn@greenjournal.org.

Date: Feb 11, 2022
To: "Kimberly B Glazer" [redacted]
From: "The Green Journal" em@greenjournal.org
Subject: Your Submission ONG-22-65

RE: Manuscript Number ONG-22-65

Distinguishing High versus Low- Performing Hospitals for Severe Maternal Morbidity: A Focus on Quality and Equity

Dear Dr. Glazer:

Your manuscript has been reviewed by the Editorial Board and by special expert referees. Although it is judged not acceptable for publication in Obstetrics & Gynecology in its present form, we would be willing to give further consideration to a revised version.

If you wish to consider revising your manuscript, you will first need to study carefully the enclosed reports submitted by the referees and editors. Each point raised requires a response, by either revising your manuscript or making a clear and convincing argument as to why no revision is needed. To facilitate our review, we prefer that the cover letter include the comments made by the reviewers and the editor followed by your response. The revised manuscript should indicate the position of all changes made. We suggest that you use the "track changes" feature in your word processing software to do so (rather than strikethrough or underline formatting).

Please be sure to address the Editor comments (see "EDITOR COMMENTS" below) in your point-by-point response.

Your paper will be maintained in active status for 21 days from the date of this letter. If we have not heard from you by Mar 04, 2022, we will assume you wish to withdraw the manuscript from further consideration.

REVIEWER COMMENTS:

Reviewer #1:

Summary: This is a qualitative study that uses 50 interviews from healthcare providers/leadership to create an evaluative metric for hospital performance regarding severe maternal morbidity and equity. The authors identified six themes that were noted in high vs low performing hospitals.

Strengths:
-This research question is critically important and pressing as we continue to struggle to properly address race-based healthcare disparities and the unacceptably high rate of SMM in the United States.

-The authors correctly identify a need to evaluate hospitals for performance against each other in this space.

-Abstract and tables are clear and easy to understand.

-The methods section is clear, and the methods used are sound given the question at hand.

-References represent a diverse array of currently available literature (including public health).

Weaknesses:
-A written out definition of SMM would benefit this paper in the introduction.
-The tool created via a positive deviance approach has severe limitations in its generalizability/application as it relies exclusively on the perspectives of healthcare providers/staff. In fact, it is a core tenant to a positive deviance approach (as cited by the author) that the members of the community involved have the knowledge and skills to fix this problem, yet their voices were not present for this research. This study would have greatly benefited from including interviews of patients and community members. As a result, this study lacks significant external validity and likely misses some of the most impactful features differentiating low and high performing hospitals.

-Throughout the manuscript, language focused on "physicians" when providers would be more appropriate. This is particularly true when the appropriate use of midwifery care on labor and delivery units has been directly tied to an improvement in race-based disparities and health outcomes in low-risk patients.

-This study is performed with health equity/disparities as a separate component rather than a central tenant woven

throughout all other components. For example, disparities are not separate a factor from organization, structural, and L&D practices as separated out in the methods section. Rather, disparities are due to factors that are interwoven into all these components of healthcare provision. Of note, the citation used by the authors (#10) that references a published perinatal quality framework recommends doing just that (incorporating health equity throughout all components of analysis and not as a separate entity itself).

-While I appreciate Table 1 and its focus on the interviewers, it would also be helpful to have a similar table that outlines the diversity of hospitals you included in your study. This would strengthen the external validity of your findings for readers.

-Is "acknowledging disparities" really what makes a hospital high performing? I would think that a commitment to improving these disparities and evidence of a system in place to evaluate disparities is more critical and reflective of a high performing hospital than simply a hospital that acknowledges that disparities exist. I am surprised to hear this did not come out in any interviews as it does not reflect current understanding of disparities.

Reviewer #2:

The authors present a qualitative study using positive deviance to evaluate the organizational policies and practices that influences high versus low severe maternal morbidity performing hospitals. Through structured interviews of various hospital staff they conclude that leadership involvement, communication, data sharing, standardization, adequate staffing and awareness of potential biases influence rates of SMM. The topic is of interest and highlights potential areas for improvement in hospital systems. The methods and results require more details to ensure the conclusions reached are supported.

Abstract: the conclusion essentially restates the results section.

Methods:
In study design please elaborate on how hospitals were assigned three tertiles of SMM? What data was collected? What factors were used for risk-adjustment? Throughout the manuscript they are referred to as high versus low. Was the middle tertile evaluated at all?

How were the four hospitals in the high and low groups selected? Why was a total of 8 hospitals selected? What factors did the two declining hospitals give for declining?

How were interviewees selected at each site? Did each site have the same number of types of participants (i.e. each include an CMO, chair, nurse and physician?).

Was consent obtained prior to the interview?

Results:
The only Table includes demographics of the interviewed participants. If the data was evaluated qualitatively and then quantitatively can the authors include data on the significant differences in themes?

The quotes are included in a lengthy supplement, a small table of the identified quotes may be better for the published manuscript.

Can the authors provide data on the number of teaching hospitals included? As quotes involve references to residents and this may not be available at all hospitals.

Discussion:
The third paragraphs' last few sentences, did the authors note increased staffing shortages in the hospitals with higher volume black patients in the current study? If this could not be shared I would include limited ability to evaluate hospital demographics as a limitation. The limitations and conclusions are well presented.

Reviewer #3: The purpose of this qualitative study is to identify organizational, practice-level, and policy factors that distinguishes high vs. low performing hospitals with regards to SMM. The topic, methodology, and conclusions of this paper are both timely and quite important for the field of obstetrics as well as for health care in the US. I feel, however, that there is some context that the study team can provide in this paper that would both strengthen it and make it slightly more accessible to the audience for which it is intended. Specifically, I think providing more background on how they are defining SMM and positive deviance frameworks is crucial. Moreover, being much more specific about their qualitative methods (recruitment, sample size, etc) and the implications would be helpful.

My specific feedback is:
1. Can the study authors perhaps explain the positive deviance framework a little more, particularly as this framework has been used in other studies and is not specific to hospital performance. I think a little more of an overview of this framework would enable readers to understand why they chose the approach they did.

2. How did the study team define SMM rates - was it the CDC classifications of SMM or another?

3. Can you expand on your recruitment process? Were people at each site emailed, contacted through personal contacts, volunteers, etc?

4. How did the team evaluate that 50 interviews were sufficient for the number of domains they analyzed?

5. The authors very briefly mention hospital learning collaboratives in the last sentence of their paper but I am curious if they can expand on this concept and why they have arrived at this. I found that the paragraph before the limitations section was incredibly important in identifying hospital, organizational, and policy-level initiatives yet there conclusions can be strengthened by perhaps offering ideas into exactly how their results could change QI practices and equity-based initiatives.

EDITOR COMMENTS:

1. The Editors of Obstetrics & Gynecology have increased transparency around its peer-review process, in line with efforts to do so in international biomedical peer review publishing. If your article is accepted, we will be posting this revision letter as supplemental digital content to the published article online. Additionally, unless you choose to opt out, we will also be including your point-by-point response to the revision letter. If you opt out of including your response, only the revision letter will be posted. Please reply to this letter with one of two responses:

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2. When you submit your revised manuscript, please make the following edits to ensure your submission contains the required information that was previously omitted for the initial double-blind peer review:
* Include your title page information in the main manuscript file. The title page should appear as the first page of the document. Add any previously omitted Acknowledgements (ie, meeting presentations, preprint DOIs, assistance from non-byline authors).
* Funding information (ie, grant numbers or industry support statements) should be disclosed on the title page and in the body text. For industry-sponsored studies, the Role of the Funding Source section should be included in the body text of the manuscript.
* Include clinical trial registration numbers, PROSPERO registration numbers, or URLs at the end of the abstract (if applicable).
* Name the IRB or Ethics Committee institution in the Methods section (if applicable).
* Add any information about the specific location of the study (ie, city, state, or country), if necessary for context.

3. Obstetrics & Gynecology uses an "electronic Copyright Transfer Agreement" (eCTA), which must be completed by all authors. When you uploaded your manuscript, each co-author received an email with the subject, "Please verify your authorship for a submission to Obstetrics & Gynecology." Please check with your coauthors to confirm that they received and completed this form, and that the disclosures listed in their eCTA are included on the manuscript's title page.

4. For studies that report on the topic of race or include it as a variable, authors must provide an explanation in the manuscript of who classified individuals' race, ethnicity, or both, the classifications used, and whether the options were defined by the investigator or the participant. In addition, the reasons that race/ethnicity were assessed in the study also should be described (eg, in the Methods section and/or in table footnotes). Race/ethnicity must have been collected in a formal or validated way. If it was not, it should be omitted. Authors must enumerate all missing data regarding race and ethnicity as in some cases, missing data may comprise a high enough proportion that it compromises statistical precision and bias of analyses by race.

Use "Black" and "White" (capitalized) when used to refer to racial categories. The nonspecific category of "Other" is a convenience grouping/label that should be avoided, unless it was a prespecified formal category in a database or research instrument. If you use "Other" in your study, please add detail to the manuscript to describe which patients were included in that category.

5. Because of space limitations, it is important that your revised manuscript adhere to the following length restrictions by manuscript type: Original Research reports should not exceed 5,500 words. Stated word limits include the title page, précis, abstract, text, tables, boxes, and figure legends, but exclude references.

6. Specific rules govern the use of acknowledgments in the journal. Please note the following guidelines:

* All financial support of the study must be acknowledged.
* Any and all manuscript preparation assistance, including but not limited to topic development, data collection, analysis, writing, or editorial assistance, must be disclosed in the acknowledgments. Such acknowledgments must identify the entities that provided and paid for this assistance, whether directly or indirectly.
* All persons who contributed to the work reported in the manuscript, but not sufficiently to be authors, must be acknowledged. Written permission must be obtained from all individuals named in the acknowledgments, as readers may infer their endorsement of the data and conclusions. Please note that your response in the journal's electronic author form verifies that permission has been obtained from all named persons.
* If all or part of the paper was presented at the Annual Clinical and Scientific Meeting of the American College of Obstetricians and Gynecologists or at any other organizational meeting, that presentation should be noted (include the exact dates and location of the meeting).
* If your manuscript was uploaded to a preprint server prior to submitting your manuscript to Obstetrics & Gynecology, add the following statement to your title page: "Before submission to Obstetrics & Gynecology, this article was posted to a preprint server at: [URL]."

7. The most common deficiency in revised manuscripts involves the abstract. Be sure there are no inconsistencies between the Abstract and the manuscript, and that the Abstract has a clear conclusion statement based on the results found in the paper. Make sure that the abstract does not contain information that does not appear in the body text. If you submit a revision, please check the abstract carefully.

In addition, the abstract length should follow journal guidelines. The word limit for Original Research articles is 300 words. Please provide a word count.

8. Only standard abbreviations and acronyms are allowed. A selected list is available online at http://edmgr.ovid.com /ong/accounts/abbreviations.pdf. Abbreviations and acronyms cannot be used in the title or précis. Abbreviations and acronyms must be spelled out the first time they are used in the abstract and again in the body of the manuscript.

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10. ACOG avoids using "provider." Please replace "provider" throughout your paper with either a specific term that defines the group to which are referring (for example, "physicians," "nurses," etc.), or use "health care professional" if a specific term is not applicable.

11. In your Abstract, manuscript Results sections, and tables, the preferred citation should be in terms of an effect size, such as odds ratio or relative risk or the mean difference of a variable between two groups, expressed with appropriate confidence intervals. When such syntax is used, the P value has only secondary importance and often can be omitted or noted as footnotes in a Table format. Putting the results in the form of an effect size makes the result of the statistical test more clinically relevant and gives better context than citing P values alone.

Please standardize the presentation of your data throughout the manuscript submission. For P values, do not exceed three decimal places (for example, "P = .001"). For percentages, do not exceed one decimal place (for example, 11.1%").

12. Please review the journal's Table Checklist to make sure that your tables conform to journal style. The Table Checklist is available online here: http://edmgr.ovid.com/ong/accounts/table_checklist.pdf.

13. Please review examples of our current reference style at http://ong.editorialmanager.com (click on the Home button in the Menu bar and then "Reference Formatting Instructions" document under "Files and Resources). Include the digital object identifier (DOI) with any journal article references and an accessed date with website references. Unpublished data, in-press items, personal communications, letters to the editor, theses, package inserts, submissions, meeting presentations, and abstracts may be included in the text but not in the reference list.

In addition, the American College of Obstetricians and Gynecologists' (ACOG) documents are frequently updated. These documents may be withdrawn and replaced with newer, revised versions. If you cite ACOG documents in your manuscript, be sure the references you are citing are still current and available. Check the Clinical Guidance page at https://www.acog.org/clinical (click on "Clinical Guidance" at the top). If the reference is still available on the site and isn't listed as "Withdrawn," it's still a current document.

If the reference you are citing has been updated and replaced by a newer version, please ensure that the new version supports whatever statement you are making in your manuscript and then update your reference list accordingly (exceptions could include manuscripts that address items of historical interest). If the reference you are citing has been withdrawn with no clear replacement, please contact the editorial office for assistance (obgyn@greenjournal.org). In most cases, if an ACOG document has been withdrawn, it should not be referenced in your manuscript.

14. Each supplemental file in your manuscript should be named an "Appendix," numbered, and ordered in the way they

are first cited in the text. Do not order and number supplemental tables, figures, and text separately. References cited in appendixes should be added to a separate References list in the appendixes file.

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If you choose to revise your manuscript, please submit your revision through Editorial Manager at http://ong.editorialmanager.com. Your manuscript should be uploaded as a Microsoft Word document. Your revision's cover letter should include the following:

* A confirmation that you have read the Instructions for Authors (http://edmgr.ovid.com/ong/accounts/authors.pdf), and
* A point-by-point response to each of the received comments in this letter. Do not omit your responses to the Editorial Office or Editors' comments.

If you submit a revision, we will assume that it has been developed in consultation with your co-authors and that each author has given approval to the final form of the revision.

Again, your paper will be maintained in active status for 21 days from the date of this letter. If we have not heard from you by Mar 04, 2022, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,

Ebony B. Carter, MD, MPH
Associate Editor, Equity

2020 IMPACT FACTOR: 7.661
2020 IMPACT FACTOR RANKING: 3rd out of 83 ob/gyn journals

March 3, 2022

Re: Distinguishing High versus Low- Performing Hospitals for Severe Maternal Morbidity: A Focus on Quality and Equity

Dear *Obstetrics & Gynecology* editorial team,

My coauthors and I appreciate the opportunity to revise our manuscript, "Distinguishing High versus Low- Performing Hospitals for Severe Maternal Morbidity: A Focus on Quality and Equity" for *Obstetrics & Gynecology*. We appreciate the thoughtful feedback from the review team and respond to each comment in red text below. In particular, we expanded on our methodology for measuring hospital-level severe maternal morbidity and added content on the positive deviance approach. We believe the suggested edits have improved the manuscript and its contribution to knowledge on the role of hospital quality in obstetric health equity.

Thank you again for your consideration.

Reviewer 1

-A written out definition of SMM would benefit this paper in the introduction.

Thank you for this suggestion. We added the CDC definition of SMM to the first sentence of the introduction and added an explanation of our methodology for measuring hospital SMM rates in a new text box (Box 1).

-The tool created via a positive deviance approach has severe limitations in its generalizability/application as it relies exclusively on the perspectives of healthcare providers/staff. In fact, it is a core tenant to a positive deviance approach (as cited by the author) that the members of the community involved have the knowledge and skills to fix this problem, yet their voices were not present for this research. This study would have greatly benefited from including interviews of patients and community members. As a result, this study lacks significant external validity and likely misses some of the most impactful features differentiating low and high performing hospitals.

We agree that including patient and community voices is critical in health services and health equity research. This study was carried out in collaboration with a scientific advisory group that included community organization participation. Advisory group discussions informed the research design and topics included in the interview guide. In concurrent qualitative research, we conducted focus groups with patients on experiences of severe maternal morbidity [1], delivery of a high-risk infant [2], and the postpartum period [3] to understand hospital quality and racial and ethnic disparities. Applying a positive deviance lens to understand disparities from the patient perspective is a worthwhile avenue for further research.

We added a statement on the scientific advisory group to the methods section, and added the following text to the Limitations:

"Our findings represent health care provider perspectives, and do not address hospital quality from patient or community viewpoints. Existing qualitative studies have focused on deficiencies in the patient experience that explain maternal health disparities[51–54]. Further research applying a positive deviance lens to the patient perspective may help to identify additional features that differentiate high- versus low-performing hospitals."

-Throughout the manuscript, language focused on "physicians" when providers would be more appropriate. This is particularly true when the appropriate use of midwifery care on labor and delivery units has been directly tied to an improvement in race-based disparities and health outcomes in low-risk patients.

We appreciate this point, but follow the Journal's guidance to refer to the type of clinician (e.g. nurse, physician) as opposed to the term provider. We refer specifically to physicians because we were unable to include midwives in our interviews since not all sites had midwives practicing in the hospital.

-This study is performed with health equity/disparities as a separate component rather than a central tenant woven throughout all other components. For example, disparities are not separate a factor from organization, structural, and L&D practices as separated out in the methods section. Rather, disparities are due to factors that are interwoven into all these components of healthcare provision. Of note, the citation used by the authors (#10) that references a published perinatal quality framework recommends doing just that (incorporating health equity throughout all components of analysis and not as a separate entity itself).

This study provides qualitative support to our previous quantitative findings [4, 5] that hospital quality contributes substantially to racial-ethnic disparities in SMM. Specifically, we found wide variation in risk-adjusted SMM rates across NYC hospitals and that Black and Latina women disproportionately delivered in hospitals with poor performance on SMM. The present analysis adds depth to these quantitative findings by describing how hospital structural and organizational factors influence between-hospital differences in perinatal quality and outcomes [6].

We edited the first paragraph of the Discussion as follows, to link the present study more clearly to quantitative research demonstrating the contribution of hospital quality to SMM disparities:

"We found that high- and low-performing hospitals for SMM faced similar organizational challenges, consistent with prior research investigating hospital quality in the perinatal setting[15,16]. Despite these similarities, six themes emerged from our positive deviance approach that distinguished high- from low-performing hospitals. Given previous findings that delivery in low-performing hospitals plays a determining role in generating ethnic and racial inequity in SMM[2,3], the present study illustrates the potential for improvement in maternal outcomes as well as the inequity in outcomes through better care organization and practice."

-While I appreciate Table 1 and its focus on the interviewers, it would also be helpful to have a similar table that outlines the diversity of hospitals you included in your study. This would strengthen the external validity of your findings for readers.

We are unable to present characteristics of the individual hospitals given the constraints of our data use agreements. However, we added a table (new Table 1) summarizing the characteristics of the eight hospitals included in our analysis.

-Is "acknowledging disparities" really what makes a hospital high performing? I would think that a commitment to improving these disparities and evidence of a system in place to evaluate disparities is more critical and reflective of a high performing hospital than simply a hospital that acknowledges that disparities exist. I am surprised to hear this did not come out in any interviews as it does not reflect current understanding of disparities.

It is a good point that commitment to tracking and reducing disparities – beyond acknowledging that disparities exist – is needed to improve performance on health equity. In a 2018 consensus statement published in the Green Journal (Howell et al, "Reduction of peripartum racial and ethnic disparities: A conceptual framework and maternal safety consensus bundle"), we called for hospitals to develop disparities dashboards to monitor process and outcome metrics stratified by race and ethnicity and regularly disseminate stratified performance data to hospital staff and leadership. However, at the time of our interviews for this study, no hospitals had implemented this type of approach to quality improvement and knowledge of racial and ethnic disparities within health care systems had not been a focus of perinatal health services research. Recently, health systems have begun to implement interventions such as disparities dashboards and evaluating these initiatives is a priority for future research.

We edited the final paragraphs of the discussion that focuses on acknowledging disparities as follows (content added is in bold text):

*"**Although none of the hospitals had any focus on structured monitoring of quality indicators by race/ethnicity, awareness of racial and ethnic inequity distinguished the organizational culture in high-performing hospitals.** To our knowledge, this attribute on a hospital level has not been previously identified, although bias in maternal health care delivery, both explicit biases and implicit or unconscious attitudes, has been documented extensively in the scientific literature and news media[46–48]. Recently, the Centers for Disease Control and Prevention added discrimination and interpersonal and structural racism as contributing factors in their standardized data system for maternal death reviews[39]. AIM and the Council on Patient Safety in Women's Health Care developed a patient safety bundle to address peripartum disparities which includes recommendations for supporting bias research and trainings, addressing social determinants of health and structural racism in enhanced maternal mortality and severe maternal morbidity reviews, and promoting a culture of equity[49]. **The AIM bundle also encourages hospitals to monitor process and outcome metrics stratified by race and ethnicity and regularly disseminate stratified performance data to hospital staff and leadership[49].***

Further, there is legislative momentum toward building awareness and competence among health professionals to combat racism and discrimination in obstetric care[50].

Our results raise the hypothesis that hospital learning collaboratives focused on ***optimizing organizational practices and policies, increasing clinician and staff awareness and education on maternal health disparities, and addressing structural racism may be important tools for improving equity in maternal outcomes. Some health systems have adopted multipronged approaches to maternal health disparities reduction – with targets for clinical practice; faculty, staff, and trainee education; and research development – that may serve as models for others*** [51]***. Evaluating interventions such as the implementation of implicit bias trainings and disparities dashboards to track and report disaggregated perinatal metrics on labor and delivery units is a priority for future research.****"***

Reviewer 2

The authors present a qualitative study using positive deviance to evaluate the organizational policies and practices that influences high versus low severe maternal morbidity performing hospitals. Through structured interviews of various hospital staff they conclude that leadership involvement, communication, data sharing, standardization, adequate staffing and awareness of potential biases influence rates of SMM. The topic is of interest and highlights potential areas for improvement in hospital systems. The methods and results require more details to ensure the conclusions reached are supported.

Abstract: the conclusion essentially restates the results section.

We edited the abstract conclusion as follows:

"Organizational factors, policies, and practices at multiple levels distinguish high from low-performing hospitals for severe maternal morbidity. Findings illustrate the potential for targeted quality initiatives to improve maternal health and reduce obstetric disparities arising from delivery in low-performing hospitals."

Methods:
In study design please elaborate on how hospitals were assigned three tertiles of SMM? What data was collected? What factors were used for risk-adjustment? Throughout the manuscript they are referred to as high versus low. Was the middle tertile evaluated at all?

We added a text box (Box 1) to detail the methodology we used in previous quantitative studies to measure SMM and create tertiles of hospital performance. We sampled hospitals from the highest and lowest tertiles of risk-adjusted SMM to allow for sufficient contrast to draw qualitative inference regarding characteristics that differentiate high-performing hospitals.

How were the four hospitals in the high and low groups selected? Why was a total of 8 hospitals selected? What factors did the two declining hospitals give for declining?

This research was funded by a NIH grant, with funding allotted to conduct qualitative interviews in eight hospitals. We purposively sampled the four hospitals in each cluster based on attributes including delivery volume, percent Black/Latinx deliveries, and percent Medicaid deliveries. We selected hospitals with high proportions of Black and/or Latinx deliveries given our focus on disparities. Our goal was to have hospitals with high proportion of Black/Latinx deliveries in each cluster to help us identify factors that distinguish high versus low performers in this context. Reasons for declining participation were not disclosed.

How were interviewees selected at each site? Did each site have the same number of types of participants (i.e. each include an CMO, chair, nurse and physician?).

We interviewed a similar number (6-8) and type of participants (e.g. physicians, nurses, hospital administrators) at each site. We selected and recruited interviewees through key informants (i.e. contacts in the office of the Chair of Obgyn). We contacted potential participants through e-mails and phone calls, met in person to conduct the interviews, and started the interview by obtaining written informed consent. We added these details to the data collection section of our methods text.

Was consent obtained prior to the interview?

Yes, we specify in the paragraph on data collection that all interviewees provided written informed consent.

Results:
The only Table includes demographics of the interviewed participants. If the data was evaluated qualitatively and then quantitatively can the authors include data on the significant differences in themes?

We did not conduct any quantitative analysis of the data collected for this study. The quantitative findings referred to in the paper are the results of two previous studies that measured risk-adjusted rates of SMM in NYC hospitals and estimated the proportion of Black-white and Latina-white SMM disparities attributable to the delivery hospital. We added a text box (Box 1) to the manuscript that describes our previous quantitative methodology.

The quotes are included in a lengthy supplement, a small table of the identified quotes may be better for the published manuscript.

We removed the supplemental table with participant quotations and instead left the most salient quotes highlighted in the text to be responsive to this comment. We can include the supplemental table of quotes if the editors feel it would be preferable to make this material available. Readers may also contact us to obtain these additional data.

Can the authors provide data on the number of teaching hospitals included? As quotes involve references to residents and this may not be available at all hospitals.

All hospitals included in our analyses were teaching hospitals. This information is now shown in the new Table 1 (summary of hospital characteristics).

Discussion:
The third paragraphs' last few sentences, did the authors note increased staffing shortages in the hospitals with higher volume black patients in the current study? If this could not be shared I would include limited ability to evaluate hospital demographics as a limitation. The limitations and conclusions are well presented.

We were not able to show whether staff shortages were more predominant in hospital with higher volumes of Black patients according to our data use agreements that prevented us from presenting potentially identifiable hospital characteristics in the two study groups. We added the following text to acknowledge this limitation:

"We were limited in our ability to evaluate the influence of hospital demographics due to confidentiality restrictions."

Reviewer 3

The purpose of this qualitative study is to identify organizational, practice-level, and policy factors that distinguishes high vs. low performing hospitals with regards to SMM. The topic, methodology, and conclusions of this paper are both timely and quite important for the field of obstetrics as well as for health care in the US. I feel, however, that there is some context that the study team can provide in this paper that would both strengthen it and make it slightly more accessible to the audience for which it is intended. Specifically, I think providing more background on how they are defining SMM and positive deviance frameworks is crucial. Moreover, being much more specific about their qualitative methods (recruitment, sample size, etc) and the implications would be helpful.

Thank you for these comments to improve accessibility of the article to wider audiences. We now explain the definition and calculation of hospital risk-adjusted SMM rates in a new text box in the manuscript (Box 1), and provide more detail on the positive deviance approach.

My specific feedback is:
1. Can the study authors perhaps explain the positive deviance framework a little more, particularly as this framework has been used in other studies and is not specific to hospital performance. I think a little more of an overview of this framework would enable readers to understand why they chose the approach they did.

We moved content on positive deviance to the introduction to better articulate our framing up-front for the reader. We also expanded our explanation of the positive deviance approach in the "study design" section of our methods and provide reference #8 for a detailed analysis of the application of positive deviance to obstetric quality and equity (Howell EA, et al. Positive deviance to address health equity in quality and safety in obstetrics. *Clin Obstet Gynecol*. 2019;62(3):560-571).

2. How did the study team define SMM rates - was it the CDC classifications of SMM or another?

We followed the CDC algorithm to define SMM. We now detail how we calculated risk-adjusted SMM rates for each hospital in Box 1.

3. Can you expand on your recruitment process? Were people at each site emailed, contacted through personal contacts, volunteers, etc?

We selected and recruited interviewees through key informants (i.e. contacts in the office of the Chair of Obgyn). We contacted potential participants through e-mails and phone calls, met in person to conduct the interviews, and started the interview by obtaining written informed consent. We added details on these processes to the data collection section of our methods text.

4. How did the team evaluate that 50 interviews were sufficient for the number of domains they analyzed?

We followed the methods of other researchers who have used the positive deviance approach to examine high and low hospital performance for cardiology and other chronic care (e.g. Bradley EH et al. J Am Med Assoc. 2001;285(20); Gabbay RA, et al. Ann Fam Med. 2013;11). We aimed to have 6-8 interviews at each hospital with individuals in specific roles (chairs of ob/gyn, physician/nurse quality lead on L&D, head nurse, etc). We interviewed individuals in similar roles across the hospital clusters and worked with our scientific advisory group to determine the specific roles we should include. We were limited to including eight hospitals because of study funding and feasibility. The process of coordinating hospital participation and obtaining appropriate permissions took eight months, and an additional eight months were required to schedule interviews, travel to the various site visits, and conduct the interviews.

5. The authors very briefly mention hospital learning collaboratives in the last sentence of their paper but I am curious if they can expand on this concept and why they have arrived at this. I found that the paragraph before the limitations section was incredibly important in identifying hospital, organizational, and policy-level initiatives yet there conclusions can be strengthened by perhaps offering ideas into exactly how their results could change QI practices and equity-based initiatives.

Thank you for this suggestion. We moved this point up and expanded on it in a new final paragraph of the discussion section:

"Our results raise the hypothesis that hospital learning collaboratives focused on optimizing organizational practices and policies, increasing clinician and staff awareness and education on maternal health disparities, and addressing structural racism may be important tools for improving equity in maternal outcomes. Some health systems have adopted multipronged approaches to maternal health disparities reduction – with targets for clinical practice; faculty, staff, and trainee education; and research development – that may serve as models for others[51].

Evaluating interventions such as the implementation of implicit bias trainings and disparities dashboards to track and report disaggregated perinatal metrics on labor and delivery units is a priority for future research."

EDITOR COMMENTS:

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previous quantitative studies of risk-adjusted hospital severe maternal morbidity rates by maternal self-report on the birth certificate.

Use "Black" and "White" (capitalized) when used to refer to racial categories. The nonspecific category of "Other" is a convenience grouping/label that should be avoided, unless it was a prespecified formal category in a database or research instrument. If you use "Other" in your study, please add detail to the manuscript to describe which patients were included in that category.

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