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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Date: Aug 30, 2021
To: "Michelle P Debbink" [redacted]
From: "The Green Journal" em@greenjournal.org
Subject: Your Submission ONG-21-1583

RE: Manuscript Number ONG-21-1583

Racial and ethnic inequities in cesarean birth and maternal morbidity in a low-risk nulliparous cohort

Dear Dr. Debbink:

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 14 days from the date of this letter. If we have not heard from you by Sep 13, 2021, we will assume you wish to withdraw the manuscript from further consideration.

REVIEWER COMMENTS:

Reviewer #1:

Congratulations to the authors on their manuscript evaluating race and ethnicity differences in cesarean birth and maternal morbidity in low-risk nulliparas at term.
1) Interesting findings in this manuscript. The authors do a good job of walking the reader through potential explanations of their findings, including the impact/possibility of bias in outcomes.
2) Besides the mode of delivery, did the authors identify any other issues that could explain/ contribute to the high rates of infection-related morbidity?
3) Tables are well done, informative and concise.

Reviewer #2:

The authors present a secondary analysis of the ARRIVE trial which was a randomized trial of expectant management versus induction of labor in low-risk nulliparas at term. The objective of this secondary analysis was to assess whether racial and ethnic disparities in cesarean birth exist. Associations between race and ethnicity, cesarean birth, and maternal morbidity were evaluated as well as indications for cesarean delivery. A mediation model was used to estimate the portion of maternal morbidity attributable to cesarean by race and ethnicity. I have the following comments/questions:
1) In the Discussion, the authors state that "limited access to care at term could lead to delayed diagnosis of a post-randomization indication for delivery (e.g. HDP), which may subsequently increase the risk for cesarean." However, the results do not support this hypothesis as both non-Hispanic black and Hispanic people were more likely than non-Hispanic white people to be diagnosed with preeclampsia/gestational hypertension (15.7% vs. 13.8%, vs 8.5%, $p<0.001$ - Table 1) after randomization.
2) After seeing the results, one may wonder if elective induction at 39 weeks increases morbidity in Hispanics and non-Hispanic blacks. I think it's important to include in either the Background or Methods section that subgroup analysis in the ARRIVE trial showed no significant differences in the results according to race or ethnic group and to emphasize in the

Discussion that withholding elective induction in these groups is NOT the solution.

Reviewer #3:

The authors set out to understand whether racial and ethnic differences exist in a low-risk nulliparas population. This is a secondary analysis of the ARRIVE trial.
Overall this manuscript is well written, well-organized and addresses a critical issue in obstetrics care. The fundamental findings in this manuscript help to identify some of the attributable risk in morbidity NHB and Hispanic people face in the US.
Minor recommendations below:
1. On line 133 spell out numbers when they begin a sentence.
2. In line 156 please clarify if these differences are statistically significant in the text.
3. On line 166 consider changing "or" to "and"

STATISTICS EDITOR COMMENTS:

Tables 1 and 2: The stats tests used evaluates whether the distribution of counts or values across all 3 cohorts differs from random, it does not specifically attribute the difference to a particular cohort. Should also provide (or substitute) pair-wise stats test to compare the referent group vs the Hispanic and Non-Hispanic Black groups separately.

Table 3: While the overall samples are large, some subsets are not. For example the subset with CD indication "other" represents < 2% of the entire sample and < 10% of all cesarean births. The multivariable adjustment models for "other" are over fitted and under powered and should should be omitted. Other studies have demonstrated the racial/ethnic differences in maternal morbidity, the counts in this study are too few to allow for multivariable adjustment with the number of factors used in Model 3. Further, the nominal differences in aOR between maternal morbidity and maternal morbidity after adjustment for cesarean birth are statistically no different. That is, the CIs sufficiently overlap that the difference falls in the range of random error. So, the conclusion that a portion of the excess maternal morbidity is attributable to differential rates of cesarean birth, while clinically plausible, is not supported by this data analysis.

EDITORIAL OFFICE 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:

A. OPT-IN: Yes, please publish my point-by-point response letter.
B. OPT-OUT: No, please do not publish my point-by-point response letter.

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. Our journal requires that all evidence-based research submissions be accompanied by a transparency declaration statement from the manuscript's lead author. The statement is as follows: "The lead author* affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained." *The manuscript's guarantor.

If you are the lead author, please include this statement in your cover letter. If the lead author is a different person, please ask him/her to submit the signed transparency declaration to you. This document may be uploaded with your submission in Editorial Manager.

5. 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.

6. Standard obstetric and gynecology data definitions have been developed through the reVITALize initiative, which was convened by the American College of Obstetricians and Gynecologists and the members of the Women's Health Registry Alliance. Obstetrics & Gynecology has adopted the use of the reVITALize definitions. Please access the obstetric data definitions at https://www.acog.org/practice-management/health-it-and-clinical-informatics/revitalize-obstetrics-data-definitions and the gynecology data definitions at https://www.acog.org/practice-management/health-it-and-clinical-informatics/revitalize-gynecology-data-definitions. If use of the reVITALize definitions is problematic, please discuss this in your point-by-point response to this letter.

7. 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.

8. 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]."

9. Provide a short title of no more than 45 characters (40 characters for case reports), including spaces, for use as a running foot.

10. 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.

11. 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.

12. The journal does not use the virgule symbol (/) in sentences with words. Please rephrase your text to avoid using "and/or," or similar constructions throughout the text. You may retain this symbol if you are using it to express data or a measurement.

13. 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.

14. 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.

If appropriate, please include number needed to treat for benefits (NNTb) or harm (NNTh). When comparing two procedures, please express the outcome of the comparison in U.S. dollar amounts.

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%").

15. 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.

16. 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.

17. Figure 1: Please name as Figure 1 in the manuscript and upload to Editorial Manager as a figure file.

When you submit your revision, art saved in a digital format should accompany it. If your figure was created in Microsoft Word, Microsoft Excel, or Microsoft PowerPoint formats, please submit your original source file. Image files should not be copied and pasted into Microsoft Word or Microsoft PowerPoint.

When you submit your revision, art saved in a digital format should accompany it. Please upload each figure as a separate file to Editorial Manager (do not embed the figure in your manuscript file).

If the figures were created using a statistical program (eg, STATA, SPSS, SAS), please submit PDF or EPS files generated directly from the statistical program.

Figures should be saved as high-resolution TIFF files. The minimum requirements for resolution are 300 dpi for color or black and white photographs, and 600 dpi for images containing a photograph with text labeling or thin lines.

Art that is low resolution, digitized, adapted from slides, or downloaded from the Internet may not reproduce.

18. 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.

19. Authors whose manuscripts have been accepted for publication have the option to pay an article processing charge and publish open access. With this choice, articles are made freely available online immediately upon publication. An information sheet is available at http://links.lww.com/LWW-ES/A48. The cost for publishing an article as open access can be found at https://wkauthorservices.editage.com/open-access/hybrid.html.

If your article is accepted, you will receive an email from the editorial office asking you to choose a publication route (traditional or open access). Please keep an eye out for that future email and be sure to respond to it promptly.

If you choose open access, you will receive an Open Access Publication Charge letter from the Journal's Publisher, Wolters Kluwer, and instructions on how to submit any open access charges. The email will be from publicationservices@copyright.com with the subject line, "Please Submit Your Open Access Article Publication Charge(s)." Please complete payment of the Open Access charges within 48 hours of receipt.

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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 Sep 13, 2021, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,
John O. Schorge, MD
Associate Editor, Gynecology

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

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[redacted]

Sept 12, 2021

Dwight J. Rouse, MD/MSPH
Editor-in-Chief
Obstetrics & Gynecology

Dear Dr. Rouse, Reviewers and Editors of ONG-21-1583:

We sincerely appreciate the opportunity to respond to the comments and questions about our manuscript, “Racial and ethnic inequities in cesarean birth and maternal morbidity in a low-risk nulliparous cohort” (ONG-21-1583) and feel that the manuscript is stronger having received and responded to your comments.

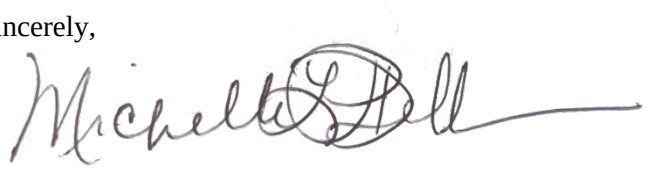
We have addressed these comments to the best of our ability and made clarifying changes in the text of the paper. Please find responses to line-by-line comments below, as well as the lines and paragraphs where the manuscript adjustments may be found.

As previously described, this study was evaluated and deemed exempt by the University of Utah Institutional Review Board, and IRB approval for the parent study was obtained at each participating site. This work was supported by external funding from multiple NICHD grants as outlined in the funding disclosures. None of the authors has any conflicts of interest to disclose related to the content of this manuscript.

As the lead author, I affirm that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

Please don’t hesitate to contact us should there be questions about any of these responses.

Sincerely,



Michelle L.P. Debbink, MD/PhD
University of Utah Department of Obstetrics and Gynecology

On behalf of my co-authors

[redacted]

REVIEWER COMMENTS:

Reviewer #1:
Congratulations to the authors on their manuscript evaluating race and ethnicity differences in cesarean birth and maternal morbidity in low-risk nulliparas at term.
1) Interesting findings in this manuscript. The authors do a good job of walking the reader through potential explanations of their findings, including the impact/possibility of bias in outcomes.

We thank the reviewer for this kind comment.

2) Besides the mode of delivery, did the authors identify any other issues that could explain/ contribute to the high rates of infection-related morbidity?

We agree that this is of interest; the diagnosis of chorioamnionitis seems to be related to infection-related morbidity in this cohort, but it does not completely explain the high rates. Since we were primarily interested in the relationship of cesarean to morbidity, we did not pursue a detailed investigation for other causes. However, if the reviewers and editors felt that a subanalysis limited only to the infection-related morbidity cases would contribute to the analysis, we would be happy to provide this. We do have some concerns about limiting sample size even further to complete such an analysis, however.

3) Tables are well done, informative and concise.

We thank the reviewer for this kind comment.

Reviewer #2:
The authors present a secondary analysis of the ARRIVE trial which was a randomized trial of expectant management versus induction of labor in low-risk nulliparas at term. The objective of this secondary analysis was to assess whether racial and ethnic disparities in cesarean birth exist. Associations between race and ethnicity, cesarean birth, and maternal morbidity were evaluated as well as indications for cesarean delivery. A mediation model was used to estimate the portion of maternal morbidity attributable to cesarean by race and ethnicity. I have the following comments/questions:

1) In the Discussion, the authors state that "limited access to care at term could lead to delayed diagnosis of a post-randomization indication for delivery (e.g. HDP), which may subsequently increase the risk for cesarean." However, the results do not support this hypothesis as both non-Hispanic black and Hispanic people were more likely than non-Hispanic white people to be diagnosed with preeclampsia/gestational hypertension (15.7% vs. 13.8%, vs 8.5%, $p<0.001$ - Table 1) after randomization.

While it is true that more non-Hispanic Black and Hispanic people were diagnosed with hypertensive disorders of pregnancy after randomization, this does not necessarily mean that diagnoses were made promptly. Lack of a timely diagnosis could lead to a more severe phenotype at presentation for delivery (and, some have argued, an increased likelihood of cesarean because of the more severe phenotype). However, we agree with the reviewer that the sentence is worded awkwardly and that the example of HDP is not particularly relevant since controlling for HDP did not change the outcome of the cesarean models. We have therefore reworded the sentence for clarity and to remove the example of HDP in Lines 230-234: “Limited

[redacted]

access to care at term among non-Hispanic Black or Hispanic people could create disparities in the timely diagnosis of post-randomization indications for delivery, and it is possible that delay in some diagnoses could increase risk of cesarean birth. Similarly, implicit and explicit bias have been associated with inappropriate dismissal of patient concerns and poor communication,[41,45,46] which may also lead to delays that could increase the risk for cesarean."

2) After seeing the results, one may wonder if elective induction at 39 weeks increases morbidity in Hispanics and non-Hispanic blacks. I think it's important to include in either the Background or Methods section that subgroup analysis in the ARRIVE trial showed no significant differences in the results according to race or ethnic group and to emphasize in the Discussion that withholding elective induction in these groups is NOT the solution.

We thank the reviewer for pointing out an interpretation of these results that we had not considered. We agree that our analysis should not be interpreted as a reason for withholding elective induction for Black or Hispanic people. We have included the following in the Background, Lines 52-56:
"Though the distribution of cesarean by race and ethnicity was not different in ARRIVE as a result of study group assignment (i.e., induction did not change the distribution of cesarean by race or ethnicity), there was a higher frequency of cesarean birth among non-Hispanic Black and Hispanic individuals in the study overall. However, i…"

We also included study group as a covariate in all analyses for this purpose, but it did not have an impact on the findings. We have attempted to clarify this in the Results, Lines 165-169: "Including assigned study group (elective induction vs expectant management) did not meaningfully alter the results, indicating that the disparity in cesarean birth was present irrespective of study group assignment; because this is a secondary analysis of a randomized controlled trial, study group was retained in the models."

Reviewer #3:
The authors set out to understand whether racial and ethnic differences exist in a low-risk nulliparas population. This is a secondary analysis of the ARRIVE trial.
Overall this manuscript is well written, well-organized and addresses a critical issue in obstetrics care. The fundamental findings in this manuscript help to identify some of the attributable risk in morbidity NHB and Hispanic people face in the US.

We thank the reviewer for this kind comment.

Minor recommendations below:
1. On line 133 spell out numbers when they begin a sentence. This was done (Line 140).
2. In line 156 please clarify if these differences are statistically significant in the text.

We have added p values from Table 2 to the text in this paragraph to address this. Lines 152-156 now read: "Just under 18% of non-Hispanic White people underwent cesarean birth, compared to 22.8% ($p<0.001$) of non-Hispanic Black and 21.9% ($p<0.001$) of Hispanic people had cesarean births. Among non-Hispanic Black and Hispanic individuals, maternal morbidity was present in 3.1% and 3.2% of deliveries respectively,

compared with 1.3% of deliveries to non-Hispanic White people (p<0.001 for each pairwise comparison)."
3. On line 166 consider changing "or" to "and". This was done (Line 165).

STATISTICS EDITOR COMMENTS:
Tables 1 and 2: The stats tests used evaluates whether the distribution of counts or values across all 3 cohorts differs from random, it does not specifically attribute the difference to a particular cohort. Should also provide (or substitute) pair-wise stats test to compare the referent group vs the Hispanic and Non-Hispanic Black groups separately.

We thank the statistical editor for suggesting pairwise comparisons. We have substituted these in both Tables 1 and 2 with a footnote to that effect. Lines 142-149 and lines 152-156 were changed to accommodate this change. In addition, we changed the continuous bivariate statistical test to Wilcoxon rank-sum, which is shown on Line 109.

Table 3: (a) While the overall samples are large, some subsets are not. For example, the subset with CD indication "other" represents < 2% of the entire sample and < 10% of all cesarean births. The multivariable adjustment models for "other" are over fitted and under-powered and should be omitted.

We thank the statistical editor for this comment. We agree that the events per variable are low for the "other" category in the multivariable multinomial logistic regression, but it is relatively close to the "rule of thumb" for 10 events per variable (87 "other" events, with an estimated 10 events per variable, gives a number of covariates of 8.7; we have 7 in our Model 3 analysis). However, we recognize that recent statistical papers have called for increasing the EPV in order to better approximate true population estimates. Therefore, we undertook a sensitivity analysis removing the other category from the mutinomial model, and the results were relatively unchanged, indicating that the inclusion of the "Other" category had not destabilized the estimates for the larger categories. The table below provides the estimates both with and without the "Other" category.

Table for Review Letter. Crude and adjusted relative risks for cesarean due to non-reassuring fetal status or labor dystocia (excluding "other") vs NRFS, labor dystocia, and other indications all retained

	Non-Hispanic Black[a] RR (95% CI)			**Hispanic[a] RR (95% CI)**		
Outcome	*Model 1* Unadjusted	*Model 2* Adjusted for clinical factors[b]	*Model 3* Adjusted for clinical & SES factors[c]	*Model 1* Unadjusted	*Model 2* Adjusted for clinical factors[b]	*Model 3* Adjusted for clinical and SES factors[c]
Cesarean indication						
Non-reassuring fetal status	2.00 (1.62-2.47)	1.98 (1.56-2.52)	1.76 (1.34-2.31)	1.62 (1.31-2.00)	1.68 (1.33-2.12)	1.52 (1.17-1.98)
Labor Dystocia	0.94 (0.74-1.19)	0.93 (0.71-1.22)	0.91 (0.67-1.23)	1.09 (0.88-1.35)	1.17 (0.92-1.48)	1.22 (0.93-1.60)
Cesarean indication						
Non-reassuring fetal status	2.00 (1.62-2.47)	1.97 (1.55-2.51)	1.74 (1.32-2.29)	1.62 (1.31-2.00)	1.67 (1.33-2.11)	1.51 (1.16-1.97)
Labor Dystocia	0.94 (0.74-1.19)	0.93 (0.71-1.21)	0.90 (0.66-1.21)	1.09 (0.88-1.35)	1.16 (0.92-1.48)	1.21 (0.92-1.59)
Other	1.05 (0.61-1.80)	1.21 (0.55-2.66)	1.29 (0.53-3.12)	1.22 (0.75-1.99)	1.63 (0.85-3.15)	1.66 (0.77-3.58)

[redacted]

Abbreviations: RR – relative risk; CI – confidence interval
a) Multinomial model with vaginal birth as the outcome referent, and non-Hispanic White as the race and ethnicity referent.
b) Clinical factors include: maternal age, maternal body mass index (BMI) at admission, modified Bishop score, and study treatment group.
c) SES factors include: employment status, insurance status, and marital status

In addition, a second point of reference is the difference between Model 2 & Model 3. Model 3 includes three sociodemographic variables, which we retained despite not being statistically significant in the models due to internal discussions/concerns over the omission of sociodemographic variables. In the "Other" category, removal of these three variables (the comparison between Models 2 and 3) does not meaningfully change the point estimates or confidence intervals, and puts the number of covariates (4) at ~50% of the limit dictated by 10 EPV. The difference between Models 2 & 3 for non-reassuring fetal status and labor dystocia results in similar width of confidence intervals and slightly more conservative point estimates. Therefore, we would like to keep our analysis as it was originally performed if the statistical editor agrees. We have added the performance of additional sensitivity tests to the methods, Lines 121-122.

(b) Other studies have demonstrated the racial/ethnic differences in maternal morbidity, the counts in this study are too few to allow for multivariable adjustment with the number of factors used in Model 3.

As with the above concern, we agree that the events per variable are low for the maternal morbidity outcome, with 132 events. However, by the same rule of thumb noted above, this provides us with the possibility of 13 covariates, and the analysis includes either 7 or 8 (depending upon whether cesarean is included). As with the response to similar concerns above, the comparison between Models 2 & 3 for maternal morbidity reveals more conservative point estimates in Model 3 with similar confidence interval widths, which overall does not change the interpretation of the relationship when fewer variables are included (Model 2). We would like to opt to keep our analysis as it was originally performed since our internal reviewers questioned the omission of the sociodemographic variables.

(c) Further, the nominal differences in aOR between maternal morbidity and maternal morbidity after adjustment for cesarean birth are statistically no different. That is, the CIs sufficiently overlap that the difference falls in the range of random error. So, the conclusion that a portion of the excess maternal morbidity is attributable to differential rates of cesarean birth, while clinically plausible, is not supported by this data analysis.

We thank the statistical editor for raising this concern. We acknowledge that adjusting the maternal morbidity outcome for cesarean results in CIs that overlap for each of the race/ethnicity variables. However, when comparing coefficients in logistic regression models to assess mediation specifically, we have followed the work of MacKinnon and others. As we understand it, we should avoid directly comparing the logistic coefficients (subtracting betas) to determine whether mediation between covariates in a logistic regression exists. Therefore, we used PROC CAUSALMED to estimate the proportion of morbidity mediated by cesarean – we have added this to the Methods: "Because adjusted coefficients in logistic regression cannot be directly compared to assess for mediation, we used SAS procedure PROC CAUSALMED." (Lines 126-127). If the editorial team finds the inclusion of the aRR for maternal morbidity models after adjusting for cesarean (the

last line in Table 3) to be confusing, we could remove this line. It was included to demonstrate incomplete mediation, but it may spur confusion rather than contributing to understanding.

We further acknowledge that the confidence intervals on the proportions of maternal morbidity mediated by cesarean are wide (e.g. 4-40%), but they do not cross zero. In order to acknowledge this, we have further softened our language around the maternal morbidity mediation in the Abstract (Lines 22 and 26), and the Discussion (added "may" to Line 196 and the following more extensive changes): "Although cesarean birth ***may*** **account for only a modest proportion** of excess morbidity among non-Hispanic Black or Hispanic people, if applied to the population, even small changes in primary cesarean may have broad ramifications for maternal morbidity" (Lines 249-251); and Lines 253-256: "Demonstrating this modest association between primary low-risk cesarean birth and excess maternal morbidity among non-Hispanic Black and Hispanic individuals contributes urgency to attempts to safely reduce primary cesarean birth, and should prompt future studies to further evaluate the relationship."

We feel that as a hypothesis generating exercise, the fact that disparities in maternal morbidity are statistically mediated by cesarean in this cohort is a novel contribution to the literature that we hope would spur future investigation to either confirm or refute our findings. In Limitations, we have added the following comment: "Of note, while the overall sample size is large, the sample sizes for some outcomes (e.g. maternal morbidity) are lower, resulting in relatively wide confidence intervals. Therefore, point estimates for these outcomes should be interpreted with caution." (Lines 261-263).

EDITORIAL OFFICE COMMENTS:

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5. 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.
Please see objectives on Line 57-62 for justification of the use of race in this study. Lines 78-79 state who classified race (participant self-identification), collected formally through a randomized controlled trial. Lines 140-142 provide numbers of individuals excluded due to identifying with a racial or ethnic group other than non-Hispanic Black, Hispanic, or non-Hispanic White. We did not use an “other” category. Black, White, and Hispanic have been capitalized throughout.

6. Standard obstetric and gynecology data definitions have been developed through the reVITALize initiative,

[redacted]

which was convened by the American College of Obstetricians and Gynecologists and the members of the Women's Health Registry Alliance. Obstetrics & Gynecology has adopted the use of the reVITALize definitions. Please access the obstetric data definitions at https://www.acog.org/practice-management/health-it-and-clinical-informatics/revitalize-obstetrics-data-definitions and the gynecology data definitions at https://www.acog.org/practice-management/health-it-and-clinical-informatics/revitalize-gynecology-data-definitions. If use of the reVITALize definitions is problematic, please discuss this in your point-by-point response to this letter.
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We have adhered to these limits. The total word count for all portions of the manuscript file, excluding references, is 5,196.

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“Short Title: Inequities in cesarean in low-risk nulliparas” was added to the manuscript underneath the Précis on page 3.

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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.

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We have two abbreviations which are not specifically listed in the standard abbreviations document, but we hope that the editors will find their use common enough to permit us to keep them in the manuscript. We abbreviated Centers for Disease Control and Prevention as CDC. We also abbreviated intensive care unit as ICU. Though [adult] ICU is not in the accepted abbreviation list, neonatal ICU (NICU) is included. In addition, we have used the approved abbreviations RR and OR for relative risk and odds ratio, respectively, but have also abbreviated “adjusted relative risk” by modifying the approved abbreviation to aRR. We are happy to spell these out if preferred.

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