

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)*
- Email correspondence between the editorial office and the authors*

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Questions about these materials may be directed to the *Obstetrics & Gynecology* editorial office:

obgyn@greenjournal.org.

Date: Jul 26, 2018
To: "Lindsay Kennedy Admon" [REDACTED]
From: "The Green Journal" em@greenjournal.org
Subject: Your Submission ONG-18-1288

RE: Manuscript Number ONG-18-1288

Racial and Ethnic Disparities in Chronic Conditions and Severe Maternal Morbidities Among Delivering Women, United States 2012-2015

Dear Dr. Admon:

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).

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 Aug 16, 2018, we will assume you wish to withdraw the manuscript from further consideration.

REVIEWER COMMENTS:

REVIEWER #1:

This is a large cross sectional study from the National Inpatient Database that included over 2 million hospitalizations representing over 12 million deliveries with 220,000 cases of severe maternal morbidity.

White women were more likely to have commercial insurance and less likely to have a cesarean delivery. They were also more likely to have substance abuse disorder and depression. Black women and American Indian women had significantly more chronic conditions and all minorities were more likely to receive blood transfusions and get hysterectomies. Severe maternal morbidities were increased in every race with more chronic conditions but most pronounced in black women compared to white women.

You appropriately describe the pitfalls of database studies.

I think you should address the increased incidence of substance use disorder and mental health issues in white women in your discussion.

REVIEWER #2:

Admon et al present a cross-sectional analysis utilizing the National Inpatient Sample to evaluate incidence of chronic conditions and severe maternal morbidity (SMM) among different racial/ethnic groups. They found that there are significant differences in chronic conditions as well as SMM among different racial groups, especially in blood transfusion as well as hysterectomy.

Overall, this is a well done study and a well written manuscript addressing an important aspect of SMM. I only have a few minor comments.

ABSTRACT:

1- In the results section, giving a range of SMM incidence is a bit confusing upfront, I would recommend just stating that these are the rates for non-Hispanic white and non-Hispanic black women.

METHODS:

2- How was missing data dealt with?

3- Line 147: "as public sources" is accidentally repeated in the sentence.

REVIEWER #3:

This is a cross-sectional analysis of 2012-2015 data from the US National Inpatient Sample describing the prevalence of chronic conditions and incidence of SMM among deliveries to non-Hispanic white, non-Hispanic black, Hispanic, Asian/Pacific Islander and American Indian/Alaskan native women. Adjusted incidence rate differences are calculated to describe disparities between racial/ethnic categories and subgroup analyses are performed to examine the incidence of SMM among deliveries to women with no, one and multiple chronic conditions in each racial/ethnic group. The authors report the incidence of SMM is significantly higher in among deliveries to women in all racial/ethnic minorities as compared to non-Hispanic whites, which is largely driven by blood transfusion and hysterectomy. Racial/ethnic minorities with an increasing number of co-morbidities had larger incidence rate differences as compared to non-Hispanic white women with multiple co-morbidities, suggesting a possible increase in case-morbidity among minority women.

Comments to Authors:

1. Abstract: The introduction focuses on the primary hypothesis that differences in SMM in minority women reflect both increased rates of comorbid conditions as well as increased case-morbidity rates when compared with white women. This issue is of extreme importance, yet there is no mention of this in the abstract. The abstract should be revised to include this. (i.e. the last sentence of the results section of the abstract should be revised to make this finding more clear.)
2. Introduction: Why is the term "incidence" rather than prevalence used to when describing the prevalence of chronic medical conditions among deliveries in this sample? It seems that prevalence would be more appropriate.
3. Methods/Results: Adjusted incidence rate differences are used throughout the paper to compare the incidence of SMM between racial/ethnic groups. Similar studies in the obstetric literature have reported adjusted risk ratios, which may be easier for clinicians to conceptualize. Can risk ratios be calculated/reported?
4. Discussion: Again, the issue of increased case-morbidity among racial/ethnic minorities is not explored in any detail in the discussion section. This should be added as a primary focus.
5. Discussion: The finding of a lower prevalence of "any 1 chronic medical condition" among racial/ethnic minorities (driven by lower rates of depression and substance use disorder) is somewhat surprising. Has this been consistently reported in other studies? Do you think this is due to lower screening/detection rates in minorities? Due to the potential for detection bias, it would be interesting to analyze the rate of SMM in women with chronic conditions other than depression and/or SUD to see if this affects your results. This finding and its implications should be addressed in the discussion.
6. Discussion: The limitations of the study are generally well-addressed, but the inability to adjust for obesity is quite significant in the context of risk factors for SMM/mortality. It would be appropriate to add a sentence or two highlight this major limitation (i.e. reference the important contribution of obesity to maternal morbidity/mortality).
7. Tables/Figures: Figure 2 would be more easily interpreted if it was re-grouped by race/ethnicity, with increasing rates of SMM demonstrated by bars representing no, 1, and ≥ 2 chronic conditions.
8. Tables/Figures: An additional figure would be useful to better illustrate the disparities in SMM by race/ethnicity (Table 3). Perhaps you could include additional bar graphs of the most common SMM by race/ethnicity to the overall SMM bar graphs in Figure 1.

STATISTICAL EDITOR'S COMMENTS:

1. lines 111-113: During the time period 2012-2015, there were some women who were represented more than once. Since those would not be independent, how were those identified and analyzed?
2. Were all deliveries included, or just singletons? If all, then was there any adjustment or sensitivity analysis related to multiple births, since those might be expected to be associated with higher morbidity rates and the likelihood of multiple births could be correlated with racial/ethnic group.
3. lines 120-125: Were there other categories of variables other than racial/ethnic that has missing values? Should enumerate and state how those were analyzed.
4. lines 203-205: Should clarify that the 222,940 is an extrapolated estimate, based on the total number of estimated deliveries. This would be a suitable paragraph to cite the actual counts of SMM for each racial/ethnic group.

5. Appendices 1, 2: Need to include the unadjusted SMM per 10,000 to contrast with the adjusted and need to include the actual counts of SMM by subset. This is particularly important for the smaller subsets (eg., API or AIAN or for the further subgroups having any 1 chronic condition or ≥ 2 chronic conditions). The samples are large, but for some of those subsets, the counts may not justify adjustment for 5 covariates. That is, SMM cited as n per 10,000 deliveries has different precision and meaning when applied to 1.4 million non-Hispanic white than to 149,000 API or 21,000 AIAN.

6. Generally in tables and Appendices, what is the justification for use of $p < .05$ as an inference threshold? The number of comparisons is large, the samples are generally very large, so the likelihood of some spurious associations seems high.

Associate Editor:

Thank you for submitting your work to Obstetrics & Gynecology. At our editorial meeting today, the sentiment was split between revise and decline. We agree that the subject is important but feel that your manuscript gives disproportionate weight to the numerical differences you observed at the expense of the small actual clinical differences. If I understand your numbers (and please, if you choose to send us a revision, pay particular attention to the comments of the Statistical Editor) the rate difference between blacks and whites of your primary outcome when you include transfusion is only 1%, and if you don't include blood transfusion it is only 0.1% (~10/10,000). Thus we would ask that you acknowledge throughout the manuscript the low actual rate differences from a clinical standpoint. And to this issue, are these low rate differences consistent with the available literature? In your revision, please put these rate differences in the context of the literature.

Moreover, with such low rate differences, what are the practical implications of trying to eliminate the differences?

Overall, although we feel that your paper may contain valuable data, its usefulness to our predominantly clinical readership in its current form is limited.

Thank you again for your submission.

Dwight J. Rouse, Md

EDITORIAL OFFICE COMMENTS:

1. The Editors of Obstetrics & Gynecology are seeking to increase 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, as well as subsequent author queries. 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:

1. OPT-IN: Yes, please publish my response letter and subsequent email correspondence related to author queries.
2. OPT-OUT: No, please do not publish my response letter and subsequent email correspondence related to author queries.

2. 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 will be transitioning as much as possible to use of the reVITALize definitions, and we encourage authors to familiarize themselves with them. The obstetric data definitions are available at <http://links.lww.com/AOG/A515>, and the gynecology data definitions are available at <http://links.lww.com/AOG/A935>.

3. 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 22 typed, double-spaced pages (5,500 words. Stated page limits include all numbered pages in a manuscript (i.e., title page, précis, abstract, text, references, tables, boxes, figure legends, and appendixes).

Please limit your Introduction to 250 words and your Discussion to 750 words.

4. Titles in Obstetrics & Gynecology are limited to 100 characters (including spaces). Do not structure the title as a declarative statement or a question. Introductory phrases such as "A study of..." or "Comprehensive investigations into..." or "A discussion of..." should be avoided in titles. Abbreviations, jargon, trade names, formulas, and obsolete terminology also should not be used in the title. Titles should include "A Randomized Controlled Trial," "A Meta-Analysis," or "A Systematic Review," as appropriate, in a subtitle. Otherwise, do not specify the type of manuscript in the title.

5. Specific rules govern the use of acknowledgments in the journal. Please edit your acknowledgments or provide more information in accordance with 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 signature on the journal's author agreement 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).

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

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 limits for different article types are as follows: Original Research articles, 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.

9. 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.

10. Please express outcome data as both absolute and relative effects since information presented this way is much more useful for clinicians. In both the Abstract and the Results section of the manuscript, please give actual numbers and percentages in addition to odds ratios (OR) or relative risk (RR). 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 dollar amounts.

11. We discourage claims of first reports since they are often difficult to prove. How do you know this is the first report? If this is based on a systematic search of the literature, that search should be described in the text (search engine, search terms, date range of search, and languages encompassed by the search). If on the other hand, it is not based on a systematic search but only on your level of awareness, it is not a claim we permit.

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. The American College of Obstetricians and Gynecologists' (College) documents are frequently updated. These documents may be withdrawn and replaced with newer, revised versions. If you cite College documents in your manuscript, be sure the reference you are citing is still current and available. If the reference you are citing has been updated (ie, 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. 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 a College document has been withdrawn, it should not be referenced in your manuscript (exceptions could include manuscripts that address items of historical interest). All College documents (eg, Committee Opinions and Practice Bulletins) may be found via the Resources and Publications page at <http://www.acog.org/Resources-And-Publications>.

If you choose to revise your manuscript, please submit your revision via Editorial Manager for Obstetrics & Gynecology at <http://ong.editorialmanager.com>. It is essential that your cover letter list point-by-point the changes made in response to each criticism. Also, please save and submit your manuscript in a word processing format such as Microsoft Word.

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

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 Aug 16, 2018, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,

The Editors of Obstetrics & Gynecology

2017 IMPACT FACTOR: 4.982

2017 IMPACT FACTOR RANKING: 5th out of 82 ob/gyn journals

If you would like your personal information to be removed from the database, please contact the publication office.

RESPONSE TO REVIEWERS

REVIEWER #1:

This is a large cross sectional study from the National Inpatient Database that included over 2 million hospitalizations representing over 12 million deliveries with 220,000 cases of severe maternal morbidity. White women were more likely to have commercial insurance and less likely to have a cesarean delivery. They were also more likely to have substance abuse disorder and depression. Black women and American Indian women had significantly more chronic conditions and all minorities were more likely to receive blood transfusions and get hysterectomies. Severe maternal morbidities were increased in every race with more chronic conditions but most pronounced in black women compared to white women. You appropriately describe the pitfalls of database studies.

Author's Response: We appreciate this feedback.

Changes to the Manuscript: N/A

1. Discussion: I think you should address the increased incidence of substance use disorder and mental health issues in white women in your discussion.

Author's Response: Thank you for this input. In response, we now highlight the increased prevalence of depression and substance use disorders identified among non-Hispanic white compared to racial/ethnic minority women in the discussion. In addition, and also in response to Reviewer #3, we include an analysis examining rates of severe maternal morbidity among women with behavioral health conditions (depression or substance use disorder) by race/ethnicity. These analyses add important data to our findings: although these conditions are less prevalent among racial/ethnic minority women, racial/ethnic minority women experience higher incidence of SMM compared to non-Hispanic white women when these conditions are present.

Changes to the Manuscript: Added: "The increasing contribution of maternal behavioral health conditions to cases of maternal death has recently been identified as an emerging concern by several state maternal mortality review committees and in a landmark report from the CDC Foundation, Building US Capacity to Review and Prevent Maternal Deaths: Report from Nine Maternal Mortality Review Committees.²⁸⁻³¹ The findings of this study reveal lower prevalence of behavioral health conditions among deliveries to racial/ethnic minority women, but higher case-morbidity when these conditions are identified. Racial and ethnic disparities in screening and referral to treatment for maternal behavioral health conditions is understudied, but have been identified with marked consistency across a wide variety of healthcare services, including within maternity care.^{32,33} Health systems must employ universal screening and referral to evidence-based treatment for affected individuals.²¹ As with other chronic conditions, this should involve examining system-level disparities in current screening and referral practices. In addition, clinicians must advocate for eliminating structural disparities in access to care through improving gaps in insurance benefits design and eligibility that disproportionately impact racial/ethnic minority women.³⁴ " pp.18, lines 387-402

REVIEWER #2:

Admon et al present a cross-sectional analysis utilizing the National Inpatient Sample to evaluate incidence of chronic conditions and severe maternal morbidity (SMM) among different racial/ethnic groups. They found that there are significant differences in chronic conditions as well as SMM among different racial groups, especially in blood transfusion as well as hysterectomy. Overall, this is a well done study and a well written manuscript addressing an important aspect of SMM. I only have a few minor comments.

Author's Response: Thank you for these comments. We appreciate your input and have addressed each point below.

Changes to the Manuscript: N/A

1. Abstract: In the results section, giving a range of SMM incidence is a bit confusing upfront, I would recommend just stating that these are the rates for non-Hispanic white and non-Hispanic black women.

Author's Response: Thank you; we agree and have edited this sentence for clarity.

Changes to the Manuscript: Edited "SMM occurred in 231.1 (95% CI 223.6-238.5) compared to 139.2 (95% CI 136.4-142.0) per 10,000 delivery hospitalizations among non-Hispanic black compared to non-Hispanic white women ($P < 0.001$)." p.3, lines 65-67

2. Methods: How was missing data dealt with?

Author's Response: Observations with missing data for race/ethnicity are not included in our analytic sample. In making this decision, we reviewed detailed AHRQ documentation and a recent report published by HCUP on missing data methods for the NIS. The NIS has a low proportion of missing data compared to other major administrative databases. In our sample of delivery hospitalizations 6.4% of observations had missing data for race ethnicity (n= 182,388/ N=2,833,249; weighted 5.8-6.9% per year for 2012-2015). Race/ethnicity data that are missing are not missing at random. According to HCUP, in some years, race is not reported for entire states and within states may be suppressed for sensitive conditions (in California for discharges in which HIV/AIDS is coded--a condition explicitly examined in our analyses). Complicating matters, state level identifiers, which would be helpful for imputation, were dropped from the NIS in 2012. Therefore, specific states cannot be singled out for special treatment of the race variable. As such, we decided to keep with other recent investigators^{1,2} not impute these data. Similarly, according to HCUP, states do not compare uniformly in inclusion criteria for the "other race" designation, and observations designated as "other race" are also not presented in these analyses (4.5%; n=127,333/N=2,833,249; weighted 4.2-4.9% per year for 2012-2015). Our final analytic sample included 2,523,528 delivery hospitalizations (2,833,249 minus 182,388 missing and 127,333 "other race" observations). This is now described in more detail in the manuscript.

In response to the reviewer, we have further explored the demographic descriptive data for observations with missing data for race/ethnicity. Relatively high proportions of observations with missing data for race/ethnicity reflect women who are commercially insured [62.3% (95% CI 60.9-63.6) commercial insurance, 32.0% (95% CI 30.8-33.2) Medicaid, 5.8% (95% CI 5.2-6.4) uninsured], higher income [18.3% (95% CI 17.0-19.7) in the bottom national income quartile], and residents of rural counties [22.7% (95% CI 21.0-24.5)]. The mean age of observations with missing data for race/ethnicity is 28.3 (95% CI 28.2-28.4) and comparatively low proportions underwent cesarean deliveries [28.9% (95% CI 28.5-26.4)]. We have also added some of this information to the manuscript (will leave keeping it up to editors' discretion).

Changes to the Manuscript: Added/edited: "HCUP reports that race/ethnicity in the NIS is not missing at random.^{10,12} We kept with other recent investigators and chose not to impute missing data for race/ethnicity.¹³ Instead, we used complete case based analysis. Descriptive demographics for observations with missing data for race/ethnicity, reveals that relatively high proportions of hospitalizations with missing data for race/ethnicity reflected women who are

¹Creanga AA, Bateman BT, Kuklina E V, Callaghan WM. Racial and ethnic disparities in severe maternal morbidity: a multistate analysis, 2008-2010. *Am J Obstet Gynecol*. 2014;210(5):435.e1-8.

²Booker WA, Gyamfi-Bannerman C, Sheen JJ, Wright JD, Siddiq Z, D'Alton ME, Friedman AM. Maternal Outcomes by Race for Women Aged 40 Years or Older. *Obstetrics & Gynecology*. 2018 Aug 1;132(2):404-13.

commercially insured [62.3% (95% CI 60.9-63.6) commercial insurance, 32.0% (95% CI 30.8-33.2) Medicaid, 5.8% (95% CI 5.2-6.4) uninsured] and higher income [only 18.3% (95% CI 17.0-19.7) in the bottom national income quartile]." p.7, lines 130-138

3. Methods: Line 147: "as public sources" is accidentally repeated in the sentence.

Author's Response: Thank you for catching this.

Changes to the Manuscript: We removed repeated "as public sources." p.8, line 161

REVIEWER #3:

This is a cross-sectional analysis of 2012-2015 data from the US National Inpatient Sample describing the prevalence of chronic conditions and incidence of SMM among deliveries to non-Hispanic white, non-Hispanic black, Hispanic, Asian/Pacific Islander and American Indian/Alaskan native women. Adjusted incidence rate differences are calculated to describe disparities between racial/ethnic categories and subgroup analyses are performed to examine the incidence of SMM among deliveries to women with no, one and multiple chronic conditions in each racial/ethnic group. The authors report the incidence of SMM is significantly higher in among deliveries to women in all racial/ethnic minorities as compared to non-Hispanic whites, which is largely driven by blood transfusion and hysterectomy. Racial/ethnic minorities with an increasing number of co-morbidities had larger incidence rate differences as compared to non-Hispanic white women with multiple co-morbidities, suggesting a possible increase in case-morbidity among minority women.

1. Abstract: The introduction focuses on the primary hypothesis that differences in SMM in minority women reflect both increased rates of comorbid conditions as well as increased case-morbidity rates when compared with white women. This issue is of extreme importance, yet there is no mention of this in the abstract. The abstract should be revised to include this. (i.e. the last sentence of the results section of the abstract should be revised to make this finding more clear.)

Author's Response: We have revised the abstract as suggested (in addition, we also refined the Precis).

Changes to the Manuscript:

- Edited Precis to read: "Racial/ethnic minority women experience higher incidence of severe maternal morbidity, and the largest disparities exist among women with co-morbid chronic conditions, reflecting increased case-morbidity." p.2, lines 46-48
- Added/edited last two sentences in results of abstract to read "Among deliveries to women with co-morbid physical and behavioral health conditions, significant differences in SMM were identified among racial/ethnic minority compared to non-Hispanic white women, reflecting increased case-morbidity. The largest racial/ethnic disparities in SMM were identified among deliveries to women with multiple chronic conditions." p.4, lines 73-77

2. Introduction: Why is the term "incidence" rather than prevalence used to when describing the prevalence of chronic medical conditions among deliveries in this sample? It seems that prevalence would be more appropriate.

Author's Response: We agree and have changed "incidence" to "prevalence" through the

manuscript when referring to the frequencies at which chronic conditions were identified in our sample. We have left the wording “incidence” when referring to the rates at which severe maternal morbidities were identified. We can change this wording simply to “rate” to avoid confusion if the editors prefer.

Changes to the Manuscript: We made corresponding changes throughout the manuscript, Tables, Figures, and Appendices as appropriate.

3. Methods/Results: Adjusted incidence rate differences are used throughout the paper to compare the incidence of SMM between racial/ethnic groups. Similar studies in the obstetric literature have reported adjusted risk ratios, which may be easier for clinicians to conceptualize. Can risk ratios be calculated/reported?

Author’s Response: We have added adjusted rate ratios to all estimates for which adjusted risk differences had been calculated and updated the methods /results sections to reflect this.

Changes to the Manuscript:

- Methods: Edited “Adjusted rate ratios and rate differences were calculated using the *adjrr* command in Stata.²¹ Rate ratios are a measure of relative disparity that can be easily transformed into a percentage difference by multiplying the ratio by 100. In the context of health disparities, rate differences, the absolute disparity between two rates, are also often used to compare the health of a less-advantaged social group to more-advantaged.²²” p.9, lines 187-194
- Results: In each instance where rate differences are reported rate ratios are now also provided.
- Tables 2-3, Appendices 1-2

4. Discussion: Again, the issue of increased case-morbidity among racial/ethnic minorities is not explored in any detail in the discussion section. This should be added as a primary focus.

Author’s Response: Thank you for this feedback. We have re-focused our discussion around the finding of increased case-morbidity identified among racial/ethnic minority women.

Changes to the Manuscript:

1. Added “The increasing contribution of maternal behavioral health conditions to cases of maternal death has recently been identified as an emerging concern by several state maternal mortality review committees and in a landmark report from the CDC Foundation, Building US Capacity to Review and Prevent Maternal Deaths: Report from Nine Maternal Mortality Review Committees.^{29–32} The findings of this study reveal lower prevalence of behavioral health conditions among deliveries to racial/ethnic minority women, but higher case-morbidity when these conditions are identified. Racial and ethnic disparities in screening and referral to treatment for maternal behavioral health conditions is understudied, but have been identified with marked consistency across a wide variety of healthcare services, including within obstetric care.^{33,34} Health systems must employ universal screening and referral to evidence-based treatment for affected individuals.²² As with other chronic conditions, this should involve examining system-level disparities in current screening and referral practices. In addition, clinicians must advocate for eliminating structural disparities in access to care through improving gaps in insurance benefits design and eligibility that disproportionately impact racial/ethnic minority women.³⁵” pp.18, lines 387-402
2. Edited “The findings of this study also support the need for enhanced screening and timely treatment for racial/ethnic minority women with chronic physical health conditions and particularly for women with multiple chronic conditions where increased case-morbidity was also identified.^{16,36}” p.19, lines 404-407

3. Added “Across nearly all conditions, racial/ethnic minority women experienced higher case-morbidity in each category of chronic conditions examined.” p.20, lines 443-444

5. Discussion: The finding of a lower prevalence of "any 1 chronic medical condition" among racial/ethnic minorities (driven by lower rates of depression and substance use disorder) is somewhat surprising. Has this been consistently reported in other studies? Do you think this is due to lower screening/detection rates in minorities? Due to the potential for detection bias, it would be interesting to analyze the rate of SMM in women with chronic conditions other than depression and/or SUD to see if this affects your results. This finding and its implications should be addressed in the discussion.

Author's Response: Thank you for this input. In response to this feedback and feedback from Reviewer #1, we have re-framed the way in which categories of co-morbidity are defined. Instead of examining the frequencies at which 0, 1, and ≥ 2 chronic conditions are identified we have changed the “any 1 chronic condition” category to two separate categories: a.) any physical health condition (of conditions examined: asthma, hypertension, diabetes, heart disease, kidney disease, SLE, HIV/AIDs, pulmonary hypertension) and b.) any behavioral health condition (of conditions examined: depression, substance use disorder). This has allowed us to more clearly examine the relative contribution of behavioral health conditions to overall chronic disease burden and maternal morbidity. Our findings reveal that although the prevalence of behavioral health conditions is highest among non-Hispanic white women, similar to with physical health conditions, racial/ethnic minority women experience higher incidence of SMM when these conditions are identified. We have also expanded on the implications of this in our discussion.

Changes to the Manuscript:

- Results: Added/edited “To test the hypothesis that differences in SMM reflect increased case-morbidity rates among racial/ethnic minority women, particularly non-Hispanic black women, in addition to increased rates of comorbid conditions when compared with non-Hispanic white women, we estimated the incidence of SMM across deliveries in which no chronic conditions, any (≥ 1) physical health condition (of conditions examined: asthma, hypertension, diabetes, heart disease, kidney disease, SLE, HIV/AIDs, pulmonary hypertension), any (≥ 1) behavioral health condition (of conditions examined: depression, substance use disorder), and multiple (≥ 2) chronic conditions were identified. We present the incidence of SMM among women with *any* physical or behavioral health condition, as opposed to for each of the individual condition listed, as the unweighted number of cases of SMM was low within each racial/ethnic category for a number of conditions, resulting in unstable estimates. Again, we used the *adjrr* command to calculate rate ratios and rate differences across categories of morbidity.” p. 10, lines 203-216
- Findings: Added/edited “Among non-Hispanic white, non-Hispanic black, Hispanic and API women, the incidence of SMM among deliveries complicated by physical health conditions, behavioral health conditions, and multiple chronic conditions was significantly higher compared to deliveries in which no chronic conditions were identified (**Figure 3**). Racial/ethnic minority women experienced larger increases in SMM when chronic conditions were identified, suggesting increased case-morbidity. For instance, in comparing deliveries among non-Hispanic black to non-Hispanic white women, the rate difference for SMM incidence increased from 77.9 (95% CI 70.9-84.9) to 219.9 (95% CI 169.1-264.5) per 10,000 delivery hospitalizations, respectively, in comparing deliveries in which no and multiple chronic conditions were identified ($P < 0.001$; **Appendix 2**).” pp.16-16, lines 334-347
- Discussion: Please see response #4 above.

- Please also see response #2 to reviewer #1.

6. Discussion: The limitations of the study are generally well-addressed, but the inability to adjust for obesity is quite significant in the context of risk factors for SMM/mortality. It would be appropriate to add a sentence or two highlight this major limitation (i.e. reference the important contribution of obesity to maternal morbidity/mortality).

Author's Response: Thank you for this suggestion. We have added this limitation to the discussion.

Changes to the Manuscript: Edited/added: Edited/added: "Finally, we were unable to adjusted for certain obstetric risk factors (such as prenatal care access and use, presence of labor prior to cesarean delivery, or obesity) and certain hospital characteristics. Obesity in particular is an important predictor of maternal morbidity³⁸ and is detected with low sensitivity in this administrative dataset.³⁹" p. 20, lines 432-433

7. Tables/Figures: Figure 2 would be more easily interpreted if it was re-grouped by race/ethnicity, with increasing rates of SMM demonstrated by bars representing no, 1, and ≥ 2 chronic conditions.

Author's Response: Thank you for this input; we have made this change as suggested.

Changes to the Manuscript: Figure 3 (old Figure 2 is now Figure 3 given an additional Figure was requested/added (and became the new Figure 2, see response #8 below)

8. Tables/Figures: An additional figure would be useful to better illustrate the disparities in SMM by race/ethnicity (Table 3). Perhaps you could include additional bar graphs of the most common SMM by race/ethnicity to the overall SMM bar graphs in Figure 1.

Author's Response: Thanks for this suggestion, we have added a Figure (new Figure 2) to illustrate key findings from Table 3. We are happy to add CI's to this Figure if the editors prefer.

Changes to the Manuscript: Figure 2

STATISTICAL EDITOR'S COMMENTS:

1. lines 111-113: During the time period 2012-2015, there were some women who were represented more than once. Since those would not be independent, how were those identified and analyzed?

Author's Response: We agree this is an important limitation. The NIS is a 20% stratified sample of discharge records from all HCUP-participating hospitals. The NIS protects patient confidentiality and, as such, we are unable to identify individuals that may have been included more than once in the study period. As such, the unit of analysis is a delivery hospitalization, not a unique patient. We have edited our discussion of this important limitation for clarity.

Since our initial submission, we have read with interest the Green Journal's August 2018 publication by Booker et al.³ given their use of the NIS to examine racial/ethnic disparities in obstetric outcomes among women 40-54 years of age. Booker et al. state that they identified "index" delivery hospitalizations for their analytic sample. It is unclear to our team how this was done, expect that perhaps that their team may had access to patient-level identifiers in their dataset, which are not part of standard data releases for the NIS.

³Booker WA, Gyamfi-Bannerman C, Sheen JJ, Wright JD, Siddiq Z, D'Alton ME, Friedman AM. Maternal Outcomes by Race for Women Aged 40 Years or Older. *Obstetrics & Gynecology*. 2018 Aug 1;132(2):404-13.

Changes to the Manuscript: “First, we acknowledge that it is possible some women underwent more than one delivery in the study period, and each discharge record may not reflect a unique woman. As such, the unit of analysis is a delivery hospitalization not an individual woman.” p.19, lines 420-423

2. Were all deliveries included, or just singletons? If all, then was there any adjustment or sensitivity analysis related to multiple births, since those might be expected to be associated with higher morbidity rates and the likelihood of multiple births could be correlated with racial/ethnic group.

Author’s Response: Thank you for this input. Descriptive analyses reveal the following rates of multiple gestation across each racial/ethnic category: 2.0% (95% CI 2.0-2.1) among non-Hispanic white women, 2.1% (95% CI 2.1-2.5) among non-Hispanic black women, 1.3% (95% CI 1.3-1.3) among Hispanic women, 1.7% (95% CI 1.6-1.7) among API women and 1.6% (95% CI 1.4-1.8) among AIAN women. Since our primary outcome in these analyses were comparisons across non-Hispanic black and non-Hispanic white racial/ethnic categories and the prevalence of multiple gestation was not significantly different across these two groups, we did not include multiple gestation as a co-variate in our analyses.

In response to the reviewer, we have conducted sensitivity analyses additionally adjusting for multiple gestation and have found that this did not alter any major findings. We have provided here the results of sensitivity analyses additionally adjusting for multiple gestation for our primary outcome (incidence of severe maternal morbidity/mortality, results reported per 10,000 delivery hospitalizations):

	Non-Hispanic White (n=1,417,559)	Non-Hispanic Black (n=385,031)			Hispanic (n=550,771)			Asian/Pacific Islander (n=149,720)			American Indian/ Alaska Native (n=20,447)		
	Adjusted Incidence (95% CI)	Adjusted Incidence (95% CI)	Rate Ratio (95% CI)	Rate Difference (95% CI)	Adjusted Incidence (95% CI)	Rate Ratio (95% CI)	Rate Difference (95% CI)	Adjusted Incidence (95% CI)	Rate Ratio (95% CI)	Rate Difference (95% CI)	Adjusted Incidence (95% CI)	Rate Ratio (95% CI)	Rate Difference (95% CI)
Original analysis (adjusted age, income, payer, rural vs. urban residence, and hospital region)	139.2 (136.4-142.0)	231.1 (223.6-238.5)	1.7 (1.6-1.7) [†]	91.9 (84.6-99.2) [†]	170.2 (165.1-175.2)	1.2 (1.2-1.3) [†]	31.0 (25.6-36.4) [†]	162.2 (153.7-170.8)	1.2 (1.1-1.2) [†]	23.1 (14.7-31.4) [†]	206.0 (181.2-230.8)	1.5 (1.3-1.7) [†]	66.8 (42.1-91.6) [†]
Sensitivity analysis (additional adjustment for multiple gestation)	138.9 (136.1-141.8)	228.2 (220.9-235.6)	1.6 (1.6-1.7) [†]	89.3 (82.1-96.5) [†]	172.0 (166.9-177.1)	1.2 (1.2-1.3) [†]	33.0 (27.6-38.5) [†]	164.6 (155.9-173.2)	1.2 (1.1-1.2) [†]	25.6 (17.2-34.1)	206.1 (181.4-230.9)	1.5 (1.3-1.7) [†]	67.2 (42.5-91.9) [†]

Changes to the Manuscript: N/A

3. lines 120-125: Were there other categories of variables other than racial/ethnic that has missing values? Should enumerate and state how those were analyzed.

Author's Response: Thank you for this input, we have added this information to the manuscript.

Changes to the Manuscript: Added "The number of observations with missing values for these co-variables was less than 2% of all delivery hospitalizations." p.8, lines 164-165

4. lines 203-205: Should clarify that the 222,940 is an extrapolated estimate, based on the total number of estimated deliveries. This would be a suitable paragraph to cite the actual counts of SMM for each racial/ethnic group.

Author's Response: Thank you, we have made this change as suggested. Of note, these weighted estimates changed slightly in the updated manuscript given an identified coding inconsistency in use of complete case-based analysis.

Changes to the Manuscript: Edited/added: "In total, 40,873 unweighted cases of SMM were identified among non-Hispanic white (n=18,878), non-Hispanic black (n= 9,483), Hispanic (n= 9,687), API (n= 2,375), and AIAN (n= 450) women, representing 218,248 total cases of SMM." p.11, lines 236-239

5. Appendices 1, 2: Need to include the unadjusted SMM per 10,000 to contrast with the adjusted and need to include the actual counts of SMM by subset. This is particularly important for the smaller subsets (eg., API or AIAN or for the further subgroups having any 1 chronic condition or ≥ 2 chronic conditions). The samples are large, but for some of those subsets, the counts may not justify adjustment for 5 covariates. That is, SMM cited as n per 10,000 deliveries has different precision and meaning when applied to 1.4 million non-Hispanic white than to 149,000 API or 21,000 AIAN.

Author's Response: We have made the requested changes including adding unweighted numbers and unadjusted incidence estimates to all cells in Appendices 1,2.

Changes to the Manuscript: Appendices 1-2

6. Generally, in tables and Appendices, what is the justification for use of $p < .05$ as an inference threshold? The number of comparisons is large, the samples are generally very large, so the likelihood of some spurious associations seems high.

Author's Response: Thank you for bringing up this important consideration. Based on this input, we have changed the cut off for significance to $P < 0.01$.

Changes to the Manuscript: Edited methods (p.11, line 226), Tables 1-3, Appendices 1-2

ASSOCIATE EDITOR:

Thank you for submitting your work to Obstetrics & Gynecology. At our editorial meeting today, the sentiment was split between revise and decline. We agree that the subject is important but feel that your manuscript gives disproportionate weight to the numerical differences you observed at the expense of the small actual clinical differences. If I understand your numbers (and please, if you choose to send us a revision, pay particular attention to the comments of the Statistical Editor) the rate difference between blacks and whites of your primary outcome when you include transfusion is only 1%, and if you don't include blood transfusion it is only 0.1% (~10/10,000). Thus we would ask that you acknowledge throughout the manuscript the low actual rate differences from a clinical standpoint. And to this issue, are these low rate

differences consistent with the available literature? In your revision, please put these rate differences in the context of the literature. Moreover, with such low rate differences, what are the practical implications of trying to eliminate the differences?

Author's Response: Thank you for pushing us to discuss the implications of our findings more clearly. While the absolute rate differences identified are small, birth is a common event, meaning the disparities identified equate to thousands of racial/ethnic minority women every year who experience “excess” SMM compared to non-Hispanic white women. We have added calculations estimating the numbers of affected deliveries across the major outcomes examined in this study. Despite the rarity of these outcomes, we do not believe they are clinically unimportant. SMM is 100x more common than maternal death (SMM identified at rates of ~100-200/10,000 compared to 26/100,000 for maternal death⁴). Since a certain number of these cases are likely to result in death, if we focus our efforts on reducing the thousands of excess SMM cases every year, we may reduce maternal mortality, particularly racial/ethnic minority women (esp. high risk women with one and multiple chronic conditions).^{5,6}

Changes to the Manuscript:

- **Methods:** Added “We estimated excess incidence of SMM among racial/ethnic minority women compared to non-Hispanic white women by dividing the weighted number of affected observations by the incidence rate ratio (compared to non-Hispanic white women) and then subtracting these estimates from the total number of weighted cases of SMM for each racial/ethnic minority category. This process was repeated to calculate excess cases of blood transfusion, the most frequent indicator of SMM, and SMM excluding blood transfusion among delivering mothers annually in the United States.” p.9-10, lines 196-202
- **Results:** Added “Taken together, these data indicate that if racial/ethnic minority women experienced SMM at the same rate as non-Hispanic white women, this would result in a 28% reduction in cases of SMM among racial/ethnic minority women (an estimated 8,102 fewer cases per year) and a 15% overall reduction in SMM. Non-Hispanic black women would see the greatest reduction, 41% (an estimated 5,212 fewer cases per year). With respect to blood transfusion specifically, if racial/ethnic minority women experienced blood transfusion at the same rate as non-Hispanic white women, this would result in a 28% reduction in cases of blood transfusion among racial/ethnic minority women (an estimated 6,456 fewer cases per year) and a 16% overall reduction in blood transfusion. Again, non-Hispanic black women would benefit the most, a reduction of 41% (an estimated 4,177 fewer cases per year). If non-Hispanic black women experienced SMM excluding blood transfusion at the same incidence as non-Hispanic white women, we would expect a 17% reduction in cases of SMM excluding blood transfusion among non-Hispanic black women (an estimated 418 fewer cases per year).” p.15 319-332
- **Discussion:** Added “These data suggest that if racial/ethnic minority women incurred blood transfusions at the same incidence as non-Hispanic white women, this would

⁴Kassebaum NJ, Barber RM, Bhutta ZA, Dandona L, Gething PW, Hay SI, Kinfu Y, Larson HJ, Liang X, Lim SS, Lopez AD. Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet*. 2016 Oct 8;388(10053):1775-812.

⁵Callaghan WM, Creanga AA, Kuklina EV. Severe maternal morbidity among delivery and postpartum hospitalizations in the United States. *Obstetrics & Gynecology*. 2012 Nov 1;120(5):1029-36.

⁶Howell EA, Brown H, Brumley J, Bryant AS, Caughey AB, Cornell AM, Grant JH, Gregory KD, Gullo SM, Kozhimannil KB, Mhyre JM. Reduction of Peripartum Racial and Ethnic Disparities: A Conceptual Framework and Maternal Safety Consensus Bundle. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2018 May 1;47(3):275-89.

result in a 16% overall reduction in SMM and a 28% reduction in cases of blood transfusion among racial/ethnic minority women (an estimated 6,456 fewer cases per year). Non-Hispanic black women would benefit the most, experiencing a 41% reduction in blood transfusion (an estimated 4,177 fewer cases per year).” P.17, lines 362-369 (please also see discussion following this in text).

Here, we have summarized the data on which these calculations are based:

1. SMM

	Non-Hispanic White	Non-Hispanic Black	Hispanic	API	AIAN	Totals
SMM Rate Ratio:	NA	1.7	1.2	1.2	1.5	
Total weighted cases of SMM:	100,672	50,628	51,802	12,738	2,408	218,248
Total weighted cases of SMM among racial/ethnic minority women:	NA	50,628	51,802	12,738	2,408	117,576
Calculations:						
No. cases if standardized to rate among Non-Hispanic whites:	NA	29,781	43,168	10,615	1,605	85,169
Total reduction:	NA	-20,847	-8,634	-2,123	-803	-32,407
Reduction per year (total reduction/ 4 year study period):	NA	-5,212	-2,158	-531	-201	-8,102

2. Blood transfusion

	Non-Hispanic White	Non-Hispanic Black	Hispanic	API	AIAN	Totals
Blood Transfusion Rate Ratio:	NA	1.7	1.2	1.2	1.5	
Total weighted cases of blood transfusion:	69,962	40,585	40,945	9,810	1,965	163,267
Total weighted cases of blood transfusion among racial/ethnic minority women:	NA	40,585	40,945	9,810	1,965	93,305
Calculations:						
No. cases if standardized to rate among Non-Hispanic whites:	NA	23,874	34,121	8,175	1,310	67,840
Total reduction:	NA	-16,711	-6,824	-1635	-655	-25,825
Reduction per year (total reduction/ 4 year study period):	NA	-4,177	-1,706	-409	-164	-6,456

3. SMM excluding cases in which blood transfusion is the only indicator of SMM:

	Non-Hispanic White	Non-Hispanic Black
SMM without blood transfusion Rate Ratio:	NA	1.2
Total weighted cases of SMM without blood transfusion:	30,711	10,043
Total weighted cases of SMM without blood transfusion among racial/ethnic minority women:	NA	10,043
Calculations:		
No. cases if standardized to rate among Non-Hispanic whites:	NA	8,369

Total reduction:	NA	-1,674
Reduction per year (total reduction/ 4 year study period):	NA	-418

Overall, although we feel that your paper may contain valuable data, its usefulness to our predominantly clinical readership in its current form is limited. Thank you again for your submission. Dwight J. Rouse, Md

Author's Response: Thank you for your continued consideration of this work. We feel that the changes we have made in response to your feedback have strengthened our manuscript significantly and, hopefully, our communication of the importance of these findings.

Changes to the Manuscript: N/A

EDITORIAL OFFICE COMMENTS:

Author's Response/Changes to Manuscript: We have reviewed the editorial office comments provided and have made the additional changes listed below:

1. Title limited to <100 characters
2. Short title listed in title page, limited to <45 characters
3. Financial support listed in title page
4. Introduction limited to <250 words
5. Discussion limited to 750 characters—currently at 980/750; we have added a few paragraphs in response to the reviewers, but can cut back in other areas at the discretion of the editors.

Daniel Mosier

From: Admon, Lindsay [REDACTED]
Sent: Friday, August 17, 2018 4:48 PM
To: Daniel Mosier
Subject: Re: Manuscript Revisions: ONG-18-1288R1
Attachments: 18-1288R1ms (08-17-2018v4)_SMMrepsonse2_08.17.18.docx; SMMresponse2_08.17.18.docx

Hi Daniel, Thank you for the quick follow up!

Please find attached the responses to each query below. The responses can also be found as "replies" to the comments in the track changes version of the manuscript (this time I highlighted my responses in yellow to differentiate from prior responses).

Lindsay

Lindsay Admon, MD MSc
Assistant Professor, Department of Obstetrics & Gynecology
Institute for Healthcare Policy and Innovation
University of Michigan
[REDACTED]
[REDACTED]

From: Daniel Mosier <dmosier@greenjournal.org>
Sent: Friday, August 17, 2018 2:24:50 PM
To: Admon, Lindsay
Subject: RE: Manuscript Revisions: ONG-18-1288R1

Dr. Admon,

Thank you very much for the quick reply to the queries. The Editors have reviewed your latest version, and have a few follow-up questions:

1. LINE 130: Yes- please include full demographic descriptive data for the observations with missing data for race/ethnicity (to be included as supplemental digital content). Please name title this table "Appendix 1" (the original Appendix 1 should now be "Appendix 4"; see below).
2. TABLES 2 and 3: Due to the large size of these tables, and given the length of the current paper, we will ask you to place these tables in the supplemental digital content section of the paper. Please name these tables "Appendix 2 and 3," respectively, and update all citations and legends.
3. LINE 307: Ok to put back here but as you suggest, please cut down in Discussion.

When revising, use the attached version of the paper. Leave the track changes on, and do not use the "Accept all Changes" function prior to re-submission.

Please let us know if you have any questions or concerns.

Sincerely,

-Daniel Mosier

Daniel Mosier

Editorial Assistant
Obstetrics & Gynecology
Tel: 202-314-2342

From: Admon, Lindsay [REDACTED]
Sent: Friday, August 17, 2018 12:17 PM
To: Daniel Mosier <dmosier@greenjournal.org>
Cc: Dalton, Vanessa [REDACTED]; Winkelman, Tyler [REDACTED] Mishka Terplan [REDACTED]; Zivin, Kara [REDACTED]; Mhyre, Jill M [REDACTED]
Subject: Re: Manuscript Revisions: ONG-18-1288R1

Hi Daniel, Please find attached the responses to each query below. The responses can also be found as "replies" to the comments in the track changes version of the manuscript. Also attached are the completed author agreement/COI forms for Drs. Zivin and Winkelman (no COIs to disclose for either).

Thank you and please let me know if I can provide any further information.

Lindsay

Lindsay Admon, MD MSc
Assistant Professor, Department of Obstetrics & Gynecology
Institute for Healthcare Policy and Innovation
University of Michigan
[REDACTED]

From: Daniel Mosier <dmosier@greenjournal.org>
Sent: Wednesday, August 15, 2018 1:09:24 PM
To: Admon, Lindsay
Subject: Manuscript Revisions: ONG-18-1288R1

Dear Dr. Admon,

Thank you for submitting your revised manuscript. It has been reviewed by the editor, and there are a few issues that must be addressed before we can consider your manuscript further:

1. Please note the minor edits and deletions throughout. Please let us know if you disagree with any of these changes.
2. LINE 1: Please note the edited title.
3. LINE 4: Please ask Dr. Zivin to provide a completed author agreement form, which can be found at <http://edmgr.ovid.com/ong/accounts/agreementform.pdf>. Note that both the "Authorship" and "Disclosure of Potential Conflicts of Interest" sections need to be completed, along with providing a signature. Please read the form carefully.
4. LINE 33: Note edit per the journal's preferred wording.
5. LINE 40: The Editors of Obstetrics & Gynecology are seeking to increase 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, as well

as subsequent author queries. If you opt out of including your response, only the revision letter will be posted. Please reply to this query with one of two responses:

1. OPT-IN: Yes, please publish my response letter and subsequent email correspondence related to author queries.
 2. OPT-OUT: No, please do not publish my response letter and subsequent email correspondence related to author queries.
6. LINE 43: We added the information about Merck from Dr. Dalton's author agreement form.
 7. LINE 45: Dr. Winkelman did not respond to the question on the author agreement form re: potential conflicts of interest. Please ask him to resubmit the form with this information completed.
 8. LINE 78: Table 3 has "less than or equal to" 0.001. Does the abstract need to be updated?
 9. LINE 83: How do you know it was hemorrhage rather than starting lower hemoglobins?
 10. LINE 134: I don't understand this sentence
 11. LINE 232: The "non" was missing here
 12. LINE 279: Please present data in same order as in Abstract (i.e., black then white)
 13. LINE 320: Should this be "multiple chronic conditions"?
 14. LINE 329: We discourage claims of first reports since they are often difficult to prove. How do you know this is the first analysis? If this is based on a systematic search of the literature, that search should be described in the text (search engine, search terms, date range of search, and languages encompassed by the search). If on the other hand, it is not based on a systematic search but only on your level of awareness, it is not a claim we permit (please reword).
 15. LINE 343: Since your data reflect transfusion and not hemorrhage, the

Each of these points are marked in the attached manuscript. Please respond point-by-point to these queries in a return email, and make the requested changes to the manuscript. When revising, please leave the track changes on, and do not use the "Accept all Changes" function in Microsoft Word.

Please let me know if you have any questions. Your prompt response to these queries will be appreciated; please respond no later than COB on **Friday, August 17th**.

Sincerely,
-Daniel Mosier

Daniel Mosier

Editorial Assistant
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The American College of Obstetricians and Gynecologists
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Web: <http://www.greenjournal.org>

Electronic Mail is not secure, may not be read every day, and should not be used for urgent or sensitive issues

Electronic Mail is not secure, may not be read every day, and should not be used for urgent or sensitive issues

1. Please note the minor edits and deletions throughout. Please let us know if you disagree with any of these changes.
 - a. [We approve all changes.](#)
2. LINE 1: Please note the edited title.
 - a. [We approve this edit.](#)
3. LINE 4: Please ask Dr. Zivin to provide a completed author agreement form, which can be found at <http://edmgr.ovid.com/ong/accounts/agreementform.pdf>. Note that both the "Authorship" and "Disclosure of Potential Conflicts of Interest" sections need to be completed, along with providing a signature. Please read the form carefully.
 - a. [Dr. Zivin has now completed then form.](#)
4. LINE 33: Note edit per the journal's preferred wording.
 - a. [We approve this edit.](#)
5. LINE 40: The Editors of Obstetrics & Gynecology are seeking to increase 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, as well as subsequent author queries. If you opt out of including your response, only the revision letter will be posted. Please reply to this query with one of two responses:
 - a. OPT-IN: Yes, please publish my response letter and subsequent email correspondence related to author queries.
 - i. [We agree to OPT-IN.](#)
 - b. OPT-OUT: No, please do not publish my response letter and subsequent email correspondence related to author queries.
6. LINE 43: We added the information about Merck from Dr. Dalton's author agreement form.
 - a. [We approve this edit.](#)
7. LINE 45: Dr. Winkelman did not respond to the question on the author agreement form re: potential conflicts of interest. Please ask him to resubmit the form with this information completed.
 - a. [Dr. Winkelman has now completed the form.](#)
8. LINE 78: Table 3 has "less than or equal to" 0.001. Does the abstract need to be updated?
 - a. [In the specific instances noted in the abstract "less than" alone is correct. We will leave this to the editor's discretion.](#)
9. LINE 83: How do you know it was hemorrhage rather than starting lower hemoglobins?
 - a. [Please consider changing "obstetric hemorrhage" to "women at highest risk for blood transfusion." This edit was made in track changes. Please also see response to query #15 below.](#)
10. LINE 134: I don't understand this sentence
 - a. [Please consider changing to "Descriptive statistics performed with weighted frequencies reveal that observations with missing data for race/ethnicity tended to reflect women who were commercially insured \[62.3% \(95% CI 60.9-63.6\) commercial insurance, 32.0% \(95% CI 30.8-33.2\) Medicaid, 5.8% \(95% CI 5.2-6.4\) uninsured\] and higher income \[only 18.3% \(95% CI 17.0-19.7\) in the bottom national income quartile\]." This edit was made in track changes. Of note, this sentence was added in revisions to describe demographics for observations with missing data for race/ethnicity, but is not necessary and may be removed at the editor's discretion. Alternatively, if the editor is interested in including full demographic descriptive data for the observations with missing data for](#)

race/ethnicity (these observations were excluded from the analytic cohort) we are happy to provide a table for the online supplement.

11. LINE 232: The “non” was missing here
 - a. We approve this edit.
12. LINE 279: Please present data in same order as in Abstract (i.e., black then white)
 - a. We have made the suggested change in track changes.
13. LINE 320: Should this be “multiple chronic conditions”?
 - a. Could change either to “multiple chronic conditions” or “any physical health condition, any behavioral health condition, and multiple chronic conditions”—either option would be correct. We added “multiple” in track changes; however, we will leave this to the editor’s discretion.
14. LINE 329: We discourage claims of first reports since they are often difficult to prove. How do you know this is the first analysis? If this is based on a systematic search of the literature, that search should be described in the text (search engine, search terms, date range of search, and languages encompassed by the search). If on the other hand, it is not based on a systematic search but only on your level of awareness, it is not a claim we permit (please reword).
 - a. Re-worded to: “This study quantifies the magnitude of racial and ethnic disparities in [the prevalence of chronic conditions among delivering women by race/ethnicity and the differential risk associated with co- and multi-morbidity among deliveries to racial and ethnic minority women.]” This edit was made in track changes. Alternatively, if the editor prefers, the first few words of the sentence could simply read: “This study comprehensively examines...”.
15. LINE 343: Since your data reflect transfusion and not hemorrhage, the
 - a. This comment appears cut off, although I can tell it is related to comment #9 above, that when discussing the disparities in transfusion identified we don’t know what proportion is attributable to higher rates of obstetric hemorrhage vs. chronic anemia. We have added the following sentence “Blood transfusions at the time of delivery are often associated with obstetric hemorrhage.” This edit was made in track changes. Hopefully, this better sets the stage for the following discussion on the need for further research on the degree to which chronic anemia contributes to the higher rates of peri-partum blood transfusion identified in the present study.

1. LINE 130: Yes- please include full demographic descriptive data for the observations with missing data for race/ethnicity (to be included as supplemental digital content). Please name title this table "Appendix 1" (the original Appendix 1 should now be "Appendix 4"; see below).
 - a. The requested change has been made. I also added a sentence here referencing this Appendix.
2. TABLES 2 and 3: Due to the large size of these tables, and given the length of the current paper, we will ask you to place these tables in the supplemental digital content section of the paper. Please name these tables "Appendix 2 and 3," respectively, and update all citations and legends.
 - a. The requested changes have been made.
3. LINE 307: Ok to put back here but as you suggest, please cut down in Discussion.
 - a. The suggested changes have been made. I "rejected change" for data on blood transfusion that was deleted here. I cut down repeat discussion of these data in discussion.

Daniel Mosier

From: Admon, Lindsay [REDACTED]
Sent: Wednesday, August 15, 2018 3:06 PM
To: Dalton, Vanessa
Cc: Daniel Mosier
Subject: Re: Manuscript Revisions: ONG-18-1288R1

Hi Daniel Just talked to Vanessa- Bayer is current. Merck she is an unpaid Nexplanon trainer (pretty common for OBGYNs) but fine to leave based on Green Journal's preference. Will get everything to you by Friday and thanks again,

Lindsay

Lindsay Admon, MD MSc
Assistant Professor, Department of Obstetrics & Gynecology
Institute for Healthcare Policy and Innovation
University of Michigan
[REDACTED]
[REDACTED]

From: Dalton, Vanessa
Sent: Wednesday, August 15, 2018 2:42:19 PM
To: Admon, Lindsay
Cc: Daniel Mosier; Winkelman, Tyler
Subject: Re: Manuscript Revisions: ONG-18-1288R1

Thanks so much Daniel-
One correction. I have a relationship with Bayer- not Merck. Perhaps that is a typo?
Vanessa

Sent from my iPhone

On Aug 15, 2018, at 1:16 PM, Admon, Lindsay <lindskb@med.umich.edu> wrote:

Daniel, Thank you, we will complete each of the below listed edits/to do's by close of business Friday!

Lindsay

Lindsay Admon, MD MSc
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From: Daniel Mosier <dmosier@greenjournal.org>

Sent: Wednesday, August 15, 2018 1:09:24 PM

To: Admon, Lindsay

Subject: Manuscript Revisions: ONG-18-1288R1

Dear Dr. Admon,

Thank you for submitting your revised manuscript. It has been reviewed by the editor, and there are a few issues that must be addressed before we can consider your manuscript further:

1. Please note the minor edits and deletions throughout. Please let us know if you disagree with any of these changes.
2. LINE 1: Please note the edited title.
3. LINE 4: Please ask Dr. Zivin to provide a completed author agreement form, which can be found at <http://edmgr.ovid.com/ong/accounts/agreementform.pdf>. Note that both the "Authorship" and "Disclosure of Potential Conflicts of Interest" sections need to be completed, along with providing a signature. Please read the form carefully.
4. LINE 33: Note edit per the journal's preferred wording.
5. LINE 40: The Editors of Obstetrics & Gynecology are seeking to increase 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, as well as subsequent author queries. If you opt out of including your response, only the revision letter will be posted. Please reply to this query with one of two responses:
 1. OPT-IN: Yes, please publish my response letter and subsequent email correspondence related to author queries.
 2. OPT-OUT: No, please do not publish my response letter and subsequent email correspondence related to author queries.
6. LINE 43: We added the information about Merck from Dr. Dalton's author agreement form.
7. LINE 45: Dr. Winkelman did not respond to the question on the author agreement form re: potential conflicts of interest. Please ask him to resubmit the form with this information completed.
8. LINE 78: Table 3 has "less than or equal to" 0.001. Does the abstract need to be updated?
9. LINE 83: How do you know it was hemorrhage rather than starting lower hemoglobins?
10. LINE 134: I don't understand this sentence
11. LINE 232: The "non" was missing here
12. LINE 279: Please present data in same order as in Abstract (i.e., black then white)
13. LINE 320: Should this be "multiple chronic conditions"?
14. LINE 329: We discourage claims of first reports since they are often difficult to prove. How do you know this is the first analysis? If this is based on a systematic search of the literature, that search should be described in the text (search engine, search terms, date range of search, and languages encompassed by the search). If on the other hand, it is not based on a systematic search but only on your level of awareness, it is not a claim we permit (please reword).
15. LINE 343: Since your data reflect transfusion and not hemorrhage, the

Each of these points are marked in the attached manuscript. Please respond point-by-point to these queries in a return email, and make the requested changes to the manuscript. When revising, please leave the track changes on, and do not use the "Accept all Changes" function in Microsoft Word.

Please let me know if you have any questions. Your prompt response to these queries will be appreciated; please respond no later than COB on **Friday, August 17th**.

Sincerely,
-Daniel Mosier

Daniel Mosier

Editorial Assistant

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Daniel Mosier

From: Admon, Lindsay [REDACTED]
Sent: Tuesday, August 14, 2018 6:02 PM
To: Daniel Mosier
Cc: Winkelman, Tyler; Dalton, Vanessa
Subject: Re: Query on 18-1288R1

Hi Daniel, Thanks so much for reaching out for clarification.

When I originally read the Booker paper I thought their reference to "index delivery hospitalizations" meant they excluded subsequent delivery hospitalizations for a given women during the study period.

When I read it again now, I see that Booker used hospitalizations were a birth was coded--the same as our methods. Here's what they did: "For this analysis, index delivery hospitalizations were captured with International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) diagnosis codes 650 and V27.x."

In reading this again, by index, I think what they mean to convey is that they did not include postpartum readmissions (not that they had patient-level identifiers, which I am not aware of being made available to any group of researchers working with the National Inpatient Sample--including ours). So I think, reviewing this again, I initially misinterpreted Booker's methods and that they in fact used similar methods to us, which are not patient-level, and consistent with standard data practices when using the National Inpatient Sample.

Lindsay

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From: Daniel Mosier <dmosier@greenjournal.org>
Sent: Tuesday, August 14, 2018 2:50:10 PM
To: Admon, Lindsay
Subject: Query on 18-1288R1

Dear Dr. Admon,

Thank you for revising your manuscript "Racial and Ethnic Disparities in Severe Maternal Morbidity, United States 2012-2015." In our initial evaluation of your manuscript, a reader noticed this response in your cover letter:

"Since our initial submission, we have read with interest the Green Journal's August 2018 publication by Booker et al. given their use of the NIS to examine racial/ethnic disparities in obstetric outcomes among women 40-54 years of age. Booker et al. state that they identified "index" delivery hospitalizations for their analytic sample. It is unclear to our team how this was done, expect that perhaps that their team may had access to patient-level identifiers in their dataset, which are not part of standard data releases for the NIS."

Did you and your team have access to patient-level identifiers in your dataset?

Sincerely,
-Daniel Mosier

Daniel Mosier

Editorial Assistant

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From: [REDACTED]
To: [Stephanie Casway](#)
Subject: Re: O&G Art Revision: 18-1288
Date: Tuesday, August 21, 2018 9:52:52 AM

Hi Stephanie, These look good. My only edit would be to Figure 3. I would change "Multimorbidity" to "Multiple (≥ 2) Chronic Conditions" I think that would be more consistent with some changes that were made in revisions to the text.

Thanks so much,

Lindsay

Lindsay Admon, MD MSc

[REDACTED]

[REDACTED]

From: Stephanie Casway <SCasway@greenjournal.org>
Sent: Tuesday, August 21, 2018 8:58:43 AM
To: Admon, Lindsay
Subject: O&G Art Revision: 18-1288

Good Morning Dr. Admon,

Your figures and legend have been edited, and PDFs of the figures and legend are attached for your review. Please review the figures CAREFULLY for any mistakes.

PLEASE NOTE: Any changes to the figures must be made now. Changes at later stages are expensive and time-consuming and may result in the delay of your article's publication.

To avoid a delay, I would be grateful to receive a reply no later than Thursday, 8/23. Thank you for your help.

Best wishes,

Stephanie Casway, MA
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