

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*

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

Personal or nonessential information may be redacted at the editor's discretion.

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

obgyn@greenjournal.org.

Date: Feb 21, 2019
To: "Maria Small" [REDACTED]
From: "The Green Journal" em@greenjournal.org
Subject: Your Submission ONG-19-252

RE: Manuscript Number ONG-19-252

Increased Nation-wide Access to OB/GYNs through a US-Rwanda Academic Training Partnership

Dear Dr. Small:

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 Mar 14, 2019, we will assume you wish to withdraw the manuscript from further consideration.

REVIEWER COMMENTS:

Reviewer #1: The purpose of this manuscript was to discuss their "program's impact over the first 5 years through geospatial analysis of the physical location of OB/GYNs in Rwanda" using their program to train Ob/Gyns for Rwanda. This was a cohort study comparing numbers and distribution of Ob/Gyns prior to and after implantation of their program, as well as evaluating patients distance from a hospital with a trained Ob/Gyn.

1. The authors note that evaluation of their program was measured by the number of qualified OB/GYNs trained over first 5 years. Was this a 4 year residency? What determined qualified? Did they just have to graduate from a Rwandan Ob/Gyn residency program to be considered qualified? Is there a Board Certification process in Rwanda? Did those classified as qualified, have to be board eligible having passed a written examination or board certified? Are Rwandan Ob/Gyn residency programs accredited by a Residency Review Committee?

2. The authors note that "Improving health system capacity to address these acute, life-threatening events may decrease resultant mortality by 45% and disability by 36% in low and middle-income countries." Has there been any reduction in maternal or neonatal morbidity and mortality since implementation of their program? The authors have demonstrated improved access to care, but are the patients taking advantage of this care?

3. In the introduction could the authors please expand their discussion about the Rwanda health system; both private and public? In the introduction could they discuss what a health post, health center, district hospital, military hospital, provincial hospital, and referral hospital is in Rwanda? Who can go to these various tiers of care?

4. The authors note that "Hospital locations were confirmed using rooftop visualization in Google Earth." How does rooftop visualization confirm that it is a hospital? Does it distinguish a health post, health center, district hospital, military hospital, provincial hospital, and referral hospital from each other?

5. "The spatial resolution of this dataset was approximately 0.00833333 decimal degrees in the WGS84 coordinate system, which at this equatorial location corresponded to approximately 1 km² per raster cell." Could the authors expand on this discussion and provide more information about the WGS84 coordinate system?

6. The authors note that "Many low-income countries struggle with an ongoing critical shortage of health care providers in rural settings." What about rural and frontier setting in the USA and Canada? What about a critical shortage of health care providers in Native American reservations in rural/frontier USA?

7. The abstract is long. Could the authors shorten the abstract?

8. Line 155 "demonstrated provides" should it be "demonstrated providers"?
9. Line 198 "professional" Should it be "professionals"?
10. Line 368: "resourceful measures area still" should it be "are still"?
11. Line 374: "reduced during as an" should it be "reduced as"?

Reviewer #2: I applaud the authors for launching this important capacity building program to increase the number of OB/GYN providers in Rwanda.

In Precis

"Geospatial analysis [of] providers'...."

Abstract:

Methods: The flow of this section should be reworked. Consider moving Lines 136 to the end of the paragraph.

Results:

Line 149: What is the definition of "public health system" here? Does this mean government hospitals, faith-based hospitals or anything that is non-private? I know this is mentioned later in the manuscript, but it would be confusing for somebody reading only the abstract.

Lines 150: Consider adding a unit to the 49. In this case, consider "physicians", "OB/GYNs"

Line 164: As of now, I don't see a statistically significant result in the abstract to support that this program significantly increased the number of OB/GYN graduates. Consider removing "significant" unless your data can support this.

Conclusion:

Line 169 - what do you mean by "increasing demand for undergraduate and graduate medical education"

The flow of this last paragraph can be reworked. The last line seems out of place, and can be moved to the beginning of the conclusion paragraph.

Manuscript:

Introduction

Line 178 - citation needed

Line 194 - Can the authors clarify which health care indices they are referring to for this statement?

Line 198 - Since the authors already did a good job of describing the post-genocide medical system, I don't think it is necessary to emphasize again that the health care system was decimated.

Line 200 - citation needed

Lines 211-238 - The authors highlight three important deficiencies - one with the lack of qualified trained personnel, another with poor geographical access to care and delayed transfer to referral hospitals - in these three paragraphs. I found it hard to follow the paragraphs as the sentences jump from one topic to another. Please consider rewriting to improve the flow.

Line 237 - The sentence is probably more suitable in your methods section as your group has decided to use one-hour as your measurement.

Line 251 - I would consider moving this to your discussion or even as a conclusion sentence

Is your aim also to report the success of the HRH-Rwanda program in increasing the number of trained OB/GYNs? If so, this should be listed as an aim.

What is the facility delivery rate currently in Rwanda? What about the percentage of pregnant women who utilize the public hospitals versus private clinics?

Methods

Line 310 - "malariaAtlas"

Can the authors elaborate more on the HRH Rwanda program? When was it started and what does the program entail? What is the structure of the residency program and how did the government-academic partnership work?

Can you describe the mean number of OB/GYNs per hospital? Were there more OB/GYN residents being trained every year? If so, how was this accomplished? Increased recruitment or financial incentives for physicians to pursue additional training? What about physician retention as you later reference in lines 377-378?

How did you measure the Rwandan OB/GYN workforce as described in your aim? Was this assessed through a medical council registry? Is there a national database to account for every single OB/GYN?

Can you describe the way that physicians are employed in Rwanda? Are Rwandan physicians government employees who are deployed or assigned to certain hospitals? Or are physicians free agents who can sign a contract with any hospital? In other words, is the distribution of the OB/GYNs a result of an increased number of OB/GYNs and government policy to distribute the specialists, or are there other factors that encourages physicians to work in hospitals across the country?

Line 336 - These numbers are different than the numbers in your abstract. Please clarify.

Line 337 - missing a period

Lines 338-340 - Can the authors clarify this statistic? In 2016, 99.6% of women lived within 2 hours of a hospital and 100% lived within one hour? The percentage should be less for one hour than two hours.

Discussion:

Lines 348 - this is so important. I cannot agree more.

Lines 398 - This may have be addressed in the methods section as I am not familiar with the R package that the authors used. Is the travel time calculated with the speed of a car? The reason that I ask is that most patients in rural areas may not have access to cars, and would rely on public transportation or hired taxis/motorbikes/bikes to access care. While the authors are correct that there are local impediments to travel, we cannot overlook that travel time can also be affected by economic status which is not measured.

Lines 416 - Nice conclusion. I still think the authors can consider moving their last paragraph from their introduction to here.

Reviewer #3: Dr. Small and her colleagues from HRH Rwanda have pulled together a very elegant analysis of the increase in trained OB/Gyns practicing in Rwanda as a direct result of this ambitious program. Not only do they demonstrate an increase in the quantity of Ob/Gyns but the geospatial analysis of where trained OB/gyns were practicing. A significant increase in the both the number and geographic distribution of Ob/Gyns in Rwanda.

I would argue that this manuscript is very relevant to the practicing US Ob/gyn as it demonstrated the unbelievable potential to help influence care for women globally when governments and institutions collaborate. I think publication in Obstetrics and Gynecology will be inspirational to the readership. The impact of HRH Rwanda on increasing access to OB/gyn specialty care is commendable, and hopefully sustainable and replicable.

The Figures are gorgeous.

I have several suggestions to strengthen the manuscript.

More involved suggestions:

1) Overall, the manuscript could be trimmed in length, particularly the abstract, introduction and to a certain degree the discussion. I believe this will increase the audience that reads it (simple, elegant analysis, proving a point). For example, the details of the geospatial analysis need not be in the abstract. The discussion rambles a bit (odd subheading in the middle; paragraph starting at 409 may not be necessary).

2) I would add into the methods the number of US OB/gyns and US institutions that contributed to the HRH program to demonstrate the investment on the US side to the training of these individuals. Some details on specialties, subspecialties 'deployed' and length of time in Rwanda, etc. I believe these details will be inspiring but also may give a sense of the scale required to replicate this model elsewhere.

3) Did the authors consider a geospatial analysis of the facilities in the public health system in parallel with the analysis of the access to an OB/gyn? To clarify, what proportion of women lived within 10 km or 25 km of a public health facility in

the first place? Maybe the map of geographic distribution already as good as possible with the current distribution of facilities. E.g. if no facility there, hard to have the ob/gyn there. This analysis might help the Rwandan govt prioritize where to build new referral systems.

4) Please include the number of facilities where the ob/gyns are practicing. E.g. in 2011 there were 14. In how many possible facilities? Did the number of facilities increase in this time period

5) Any sense of how the Rwandan government is incentivizing the spatial distribution of graduates? This is very impressive and not found in other SSA countries where most are concentrated in urban locations. Are there plans for retention of specialty trained MDs to prevent brain drain?

Minor suggestions:

There were a number of minor punctuation and plurality mistakes so a thorough re-read of the manuscript for this level of detail would be helpful.

- consider using language that the number of faculty increased, rather than the faculty increased (kept thinking of my own expanding waistline)

-line 155 syntax unclear (providers?)

-line 157—if going to quote the 95% CI of the difference, need to include the actual point estimate of the difference

-line 151-152 are academic years the HRH program years?

-line 184: add 'system' after medical education

-line 190-191 MDG sentence (remind audience what year these decreases were to be achieved, over what time frame, and consider adding how not many other SSA achieved this

-line 198: professional should be plural

-include clear dates of when HRH started in the introduction

-line 218: spell out SSA

-were there targets for the number of residents trained? Did the 6-7/year meet or exceed these targets?

-did the trainees have to pay to be residents (as is common in nearby African nations)

-line 337 and 357- need punctuation

-line 347— improved access to care (?add reproductive health before care)

-Could add to the discussion that only 5 years in and still need to prove that this is sustainable and that trained individuals won't disappear back to the major cities

STATISTICAL EDITOR COMMENTS:

The Statistical Editor makes the following points that need to be addressed:

Results: Consider including a Table that summarizes the 2011 vs 2016 data in terms of (1) number of hospitals with OB/GYN coverage (2) proportion of country's area within 10 and 25 km and within 120 minute travel to a hospital with OB/GYN.

Fig 4: This map (and the previous maps of Rwanda) demonstrate the impact of provider/hospital locations on the geographic areas of the country, not on the population. Could a map be redrawn that would weight the areas of the country by their relative population? The proposition that "virtually all of the Rwanda population had less than a 120 minute travel time is not obvious from these maps. A better metric would be to describe the area included in the < 120 minute travel time as a % of the entire country and a description of the population included in that area vs the entire Rwandan population.

EDITOR'S COMMENTS:

1. Thank you for your submission to Obstetrics & Gynecology. In addition to the comments from the reviewers above, you are being sent a notated PDF that contains the Editor's specific comments. Please review and consider the comments in this file prior to submitting your revised manuscript. These comments should be included in your point-by-point response cover letter.

The notated PDF is uploaded to this submission's record in Editorial Manager. If you cannot locate the file, contact Randi Zung and she will send it by email - rzung@greenjournal.org.

- The précis is a single sentence of no more than 25 words, written in the present tense and stating the conclusion(s) of the report (ie, the bottom line). The précis should be similar to the abstracts conclusion. Do not use commercial names,

abbreviations, or acronyms in the précis. Précis should be the "hook" for people who scan the Table of Contents to see what to read.

Please read the instructions for authors for the Journal when you revise your paper to identify important formatting and other information.

For instance, in an original research paper, the abstract has certain headings and is limited to 300 words. Hard to count in a PDF but the abstract looks much longer than 300 words. I am not going to point out all of these sorts of formatting issue and will assume you will correct on revision.

- increased quality of and access to health care...

- so your primary outcome was# of ob gyns? Please state your primary and secondary outcomes in your methods (and the manuscript) and report them in that order in the results sections.

- is this raster or roster? I don't know what this is and perhaps others won't either. Could you state this in another way for the readership to know what it is?

- what is a buffer zone? Just the area within a circular of radius X around a hospital? what is it "buffering"?

- in the manuscript you will need to define for the readers, as noted by reviewers, what the health care system in Rwanda looks like. What does the non-public health care system look like and did you look at the consequences of that system? did all the residents trained during the program stay in the public sector?

- is the year 2011 similar to the the designation of an academic year? Please state the actual months included to avoid misunderstanding.

- how many rwandan hospitals are there?

- this sentence doesn't make sense.

- is this a change?

- This is called a primacy claim: yours is the first, biggest, etc...In order to assert that, you need to provide the search terms used and the data base (s) searched (PubMed,GOogle Scholar, etc) to substantiate the claim in the manuscript. Otherwise, it needs to be deleted. It wouldn't belong in the abstract anyway, so make sure you address this in the manuscript body. Is it important that it's the first?

- The introduction should be about 1 page in length.

- you have made some good descriptions of what the results of the program were but almost no description of the components of the program. How did the program achieve these ends?

- please use cesarean birth or delivery rather than section

- and medical education infrastructure? programs?

- health care professionals (plural)

- is this total?

- who designed it?

- spell out throughout

- For those not aware of the organization of health care services (especially ob gyn services) please provide a brief overview of the state of things: public v private; tertiary v district hospitals; clinics, etc.

- please clearly state your primary and secondary outcomes. Then, organize your methods, results and discussion sections in order of primary, then secondary outcomes.

- To be very clear, you are just focusing on emergency OB services in this study? That it what lie 241-2 would suggest.

- primary issue again.

- Somewhere you need to tell us what the HRH actually did. Were there more teaching facilities or did the only teaching hospital increase the number of trainees? If a country leadership were reading this paper and

wanted to try to replicate it, what steps were involved?

- please eliminate section headings other than introduction, materials, results, discussion
- Would a graphic help depict this for those uncertain about what is meant? For instance, how many health posts are there that are supported by a district hospital? What kind of services are available at a health post.
- antepartum care only or does this include intrapartum care?
- The Journal style doesn't not use the virgule (/) except in numeric expressions. Please edit here and in all instances.
- how many are there?
- does this mean that someone in one of this centers used GPS to obtain these coordinates? was this specifically done for this study or known otherwise?
- as noted above, this needs more explanation.
- somewhere, please make it clear how the so-called buffer zones which are distance relate to the population levels of births (so that you can draw conclusions about distance from. hospitals for women giving birth). Its not clear.
- this requires further explanation. What data supported the number of pregnant women (or reproductive age women?) in these different radii?
- is this all travel by car?
- somewhere, please provide the overall population of Rwanda in the 2 time periods and the number of births. How many medical schools are there or centers which train residents?
- You could combine this sentence with the one previously--Like: Prior to the initiation of the program, In the 7 years preceding the program, 18 residents completed training or 2.6 residents/year. This increased by 2.6 fold to 66 residents (33 total) in the years 2012-2017). By faculty, do you mean OBGYN faculty
- please note how this is a change. Were expats the previous heads of department or were they non obgyns?
- please tell us somewhere how many Rwandan hospitals there are.
- Line 330 to 333 can be combined. Please tell us how geospatial analysis is necessary for this. Since there were only 14 ob gyns during this time frame, did you need this sort of analysis to say this to be the fact? HOW many of the 14 were in either Kigali or Butare?
- in all cases, please provide statistical data to support that this represents a difference.
- other than Ob GYN health care professionals, were there other areas involved?
- 14 to 49 is much more than a near doubling. Please clarify.
- how so? you are training about 7 per year. Its 2019 and you had 49 in 2016. How will this reach 100 next year?
- Specifically, this does not relate to reaching our goals of 100 by 2020...it relates to proximity of pregnant women to providers...these are related but not the same.
- Don't just repeat your results---put this in context.
- Please be very careful on your revision to address this sort of problem, which is common in your manuscript. There is no punctuation between sentences here.
- similar to the US
- i don't understand this sentence.
- true for high income countries too.
- Universal access to health care?
- please show us where Kigali and Butare are.

- what percent of the births lie outside these areas?

2. 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.

3. As of December 17, 2018, Obstetrics & Gynecology has implemented an "electronic Copyright Transfer Agreement" (eCTA) and will no longer be collecting author agreement forms. When you are ready to revise your manuscript, you will be prompted in Editorial Manager (EM) to click on "Revise Submission." Doing so will launch the resubmission process, and you will be walked through the various questions that comprise the eCTA. Each of your coauthors will receive an email from the system requesting that they review and electronically sign the eCTA.

Any author agreement forms previously submitted will be superseded by the eCTA. During the resubmission process, you are welcome to remove these PDFs from EM. However, if you prefer, we can remove them for you after submission.

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. Have any of the figures been previously published in another source? If yes, written permission of the copyright holder must be obtained. Permission is also required for material that has been adapted or modified from another source. Both print and electronic (online) rights must be obtained from the holder of the copyright (often the publisher, not the author), and credit to the original source must be included in your manuscript. Many publishers now have online systems for submitting permissions request; please consult the publisher directly for more information.

6. All submissions that are considered for potential publication are run through CrossCheck for originality. The following lines of text match too closely to previously published works. Variance is needed in the following sections:

LINE 273-74: Citation needed ("The Rwandan Public Health...and referral hospitals").

7. Please submit a completed STROBE checklist.

Responsible reporting of research studies, which includes a complete, transparent, accurate and timely account of what was done and what was found during a research study, is an integral part of good research and publication practice and not an optional extra. Obstetrics & Gynecology supports initiatives aimed at improving the reporting of health research, and we ask authors to follow specific guidelines for reporting randomized controlled trials (ie, CONSORT), observational studies (ie, STROBE), meta-analyses and systematic reviews of randomized controlled trials (ie, PRISMA), harms in systematic reviews (ie, PRISMA for harms), studies of diagnostic accuracy (ie, STARD), meta-analyses and systematic reviews of observational studies (ie, MOOSE), economic evaluations of health interventions (ie, CHEERS), quality improvement in health care studies (ie, SQUIRE 2.0), and studies reporting results of Internet e-surveys (CHERRIES). Include the appropriate checklist for your manuscript type upon submission. Please write or insert the page numbers where each item appears in the margin of the checklist. Further information and links to the checklists are available at <http://ong.editorialmanager.com>. In your cover letter, be sure to indicate that you have followed the CONSORT, MOOSE, PRISMA, PRISMA for harms, STARD, STROBE, CHEERS, SQUIRE 2.0, or CHERRIES guidelines, as appropriate.

8. 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 and gynecology data definitions at <https://www.acog.org/About-ACOG/ACOG-Departments/Patient-Safety-and-Quality-Improvement/reVITALize>. If use of the reVITALize definitions is problematic, please discuss this in your point-by-point response to this letter.

9. 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 26 typed, double-spaced pages (6,500 words). Stated page limits include all numbered pages in a manuscript (i.e., title page, précis, abstract, text, references, tables, boxes, figure legends, and print appendixes) but exclude references.

10. 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).

11. Was this presented at the FIGO World Congress of Gynecology & Obstetrics? If so, please note the name, location, and dates of the meeting on the title page of your manuscript.

12. Provide a *précis* on the second page, for use in the Table of Contents. The *précis* is a single sentence of no more than 25 words that states the conclusion(s) of the report (ie, the bottom line). The *précis* should be similar to the abstract's conclusion. Do not use commercial names, abbreviations, or acronyms in the *précis*. Please avoid phrases like "This paper presents" or "This case presents."

13. 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.

14. 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.

15. 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.

16. Line 170: 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.

17. 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.

18. Figures 1-4: Please upload each figure as a separate file to Editorial Manager (do not embed the figure in your manuscript file).

Figure 1: Please submit the figure in the original file format it was created in. Copying and pasting the image into MS Word reduced the resolution.

Figure 2: Please include a legend or footnote to indicate that the H graphic denotes a hospital.

Figure 3: The picture of Africa needs to be labeled. It may also make more sense to have it with Figure 2, to show context of where the country is located within the continent. The "Zone Around Hospital" text can probably be deleted since it is explained in the legend.

Figure 4: Please submit the figure in the original file format it was created in. Copying and pasting the image into MS Word reduced the resolution.

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 <http://edmgr.ovid.com/acd/accounts/ifaauth.htm>.

Please note that 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.

20. 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 and that each author has given approval to the final form of the revision.

Again, your paper will be maintained in active status for 21 days from the date of this letter. If we have not heard from you by Mar 14, 2019, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,

Nancy C. Chescheir, MD
Editor-in-Chief

2017 IMPACT FACTOR: 4.982
2017 IMPACT FACTOR RANKING: 5th out of 82 ob/gyn journals

In compliance with data protection regulations, please contact the publication office if you would like to have your personal information removed from the database.

RE: Manuscript Number ONG-19-252

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Dear Dr. Small:

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Response: The Rwandan residency is 4 years in duration. We added information about the residency program duration and credentials needed. The revised wording is as follows:

Rwanda began its residency programs in 2005. The Rwandan Obgyn residency is 4 years in duration and follows an academic calendar similar to the US system. Residents meet metrics for annual promotion based on clinical performance and exam completion. Residents are qualified for graduation after successful completion of an original research thesis as well as final oral and written examinations. Final theses and oral exams are proctored by

international, external examiners. The residency program duration and graduation requirements were established at the beginning of the Rwandan residency program, in 2005, and persisted throughout the HRH program. All medical practitioners must apply for licenses to practice from the Rwandan Medical Council.

2. The authors note that "Improving health system capacity to address these acute, life-threatening events may decrease resultant mortality by 45% and disability by 36% in low and middle-income countries." Has there been any reduction in maternal or neonatal morbidity and mortality since implementation of their program? The authors have demonstrated improved access to care, but are the patients taking advantage of this care?

Response: We did not measure the impact of the program on reduced maternal and neonatal morbidity for this paper. We also believe this is a very important question. We hope to demonstrate these outcome measures in future works. The overall aim of the HRH-Rwanda program is to improve the number of trained health care professionals in order to improve access to care for Rwandans. We evaluated these aims in the current work.

3. In the introduction could the authors please expand their discussion about the Rwanda health system; both private and public? In the introduction could they discuss what a health post, health center, district hospital, military hospital, provincial hospital, and referral hospital is in Rwanda? Who can go to these various tiers of care?

Response: We revised this section to better explain the health system structure.

4. The authors note that "Hospital locations were confirmed using rooftop visualization in Google Earth." How does rooftop visualization confirm that it is a hospital? Does it distinguish a health post, health center, district hospital, military hospital, provincial hospital, and referral hospital from each other?

Response: For simplicity we have removed the reference to rooftop visualization. In Google Earth the hospitals are referenced and named, so using this technique we were able to verify that the coordinates obtained in the field were accurate (see image from Google Earth, for instance):



5. "The spatial resolution of this dataset was approximately 0.00833333 decimal degrees in the WGS84 coordinate system, which at this equatorial location corresponded to approximately 1 km² per raster cell." Could the authors expand on this discussion and provide more information about the WGS84 coordinate system?

Response: For simplicity, and because interested readers can find the coordinate system particulars in the metadata of our datasets (the sources are referenced), we have deleted the mention of the WGS84 coordinate system.

For the benefit of the reviewers, there are thousands of coordinate systems (by which any location on earth can be represented by a pair of east-west and north-south coordinates). WGS84 is probably the most commonly used coordinate system in the world. As earth is a complex spheroid and as quantitative spatial operations need to treat coordinate space like a 2D graph, there are always distortions inherent in coordinate systems, without exception.

However, this will not have particular relevance to understanding the operations or inferences in the paper. A nuanced discussion beyond the scope of this paper could visit alternative coordinate systems (which tend to favor accuracy in a parameter like distance, area, and angular relationships at the expense of the others), but converting our data to an alternative coordinate system would be highly unlikely to affect any estimates or conclusions in the study. This is partly because the area under study is relatively small and it is equatorial, both of which minimize the relevance of distortions in coordinate systems.

6. The authors note that "Many low-income countries struggle with an ongoing critical shortage of health care providers in rural settings." What about rural and frontier setting in the USA and Canada? What about a critical shortage of health care providers in Native American reservations in rural/frontier USA?

Response: These are very important questions. We are examining this issue of rural access to obstetric care in our state of NC. We focused this paper on low income countries. Your comments, however, highlight the importance of understanding how other global settings may address issues related to incentives for obstetrician gynecologists to work in rural settings and how centralization of maternity services may impact rural care.

7. The abstract is long. Could the authors shorten the abstract?

Response: We have shortened the abstract to 300 words.

8. Line 155 "demonstrated provides" should it be "demonstrated providers"?

Response: Yes! We have made this correction.

9. Line 198 "professional" Should it be "professionals"?

Response: Yes! We have made this correction.

10. Line 368: "resourceful measures area still" should it be "are still"?

Response: Yes! We have made this correction

11. Line 374: "reduced during as an" should it be "reduced as"?

Response: Yes! We have made this correction

Reviewer #2: I applaud the authors for launching this important capacity building program to increase the number of OB/GYN providers in Rwanda.

In Precis
"Geospatial analysis [of] providers'...."

Response: Thank you. We have corrected the precis.

Methods: The flow of this section should be reworked. Consider moving Lines 136 to the end of the paragraph.

Response: We have reworked the methods, thank you.

Results:
Line 149: What is the definition of "public health system" here? Does this mean government hospitals, faith-based hospitals or anything that is non-private? I know this is mentioned later in the manuscript, but it would be confusing for somebody reading only the abstract.

Response: We changed the wording to state, "public (government)" for further clarification.

Lines 150: Consider adding a unit to the 49. In this case, consider "physicians", "OB/GYNs"

Response: We reworded the abstract, including this sentence, for clarity.

Line 164: As of now, I don't see a statistically significant result in the abstract to support that this program significantly increased the number of OB/GYN graduates. Consider removing "significant" unless your data can support this.

Response: We have removed this wording from the abstract.

Conclusion:

Line 169 - what do you mean by "increasing demand for undergraduate and graduate medical education"?

The flow of this last paragraph can be reworked. The last line seems out of place, and can be moved to the beginning of the conclusion paragraph.

Response: We have reworded the abstract conclusion. It is now shorter and we deleted line 169.

Manuscript:

Introduction

Line 178 - citation needed

Response: We added the appropriate citation. Thank you.

Line 194 - Can the authors clarify which health care indices they are referring to for this statement?

Response: We added the word, "perinatal" to clarify the statement to reflect the previously referred to perinatal health indices.

"Despite these improvements, however, *perinatal* health care indices remain suboptimal and further improvements require additional investment in the national health care system."

Line 198 - Since the authors already did a good job of describing the post-genocide medical system, I don't think it is necessary to emphasize again that the health care system was decimated.

Response: We deleted the repeat reference to the genocide against the Tutsis found in this sentence. The sentence now reads:

"Recognizing the critical need for highly trained health care professional, in 2011 the Rwandan government embarked on a novel medical education program to improve their

health care system."

Line 200 - citation needed

Response: We added the citation. Thank you.

Lines 211-238 - The authors highlight three important deficiencies - one with the lack of qualified trained personnel, another with poor geographical access to care and delayed transfer to referral hospitals - in these three paragraphs. I found it hard to follow the paragraphs as the sentences jump from one topic to another. Please consider rewriting to improve the flow.

Response: We revised this section; hopefully, it is now clearer

Line 237 - The sentence is probably more suitable in your methods section as your group has decided to use one-hour as your measurement.

Response: We used one and two hour distances as part of the analysis. We mentioned the one hour distance only to note that for Rwanda, the two hour distance may not be an adequate measure. We revised this section of the introduction and clearly stated the use of both one and two hour distances as part of the analysis.

Line 251 - I would consider moving this to your discussion or even as a conclusion sentence.

Response: We completely revised the discussion section.

Is your aim also to report the success of the HRH-Rwanda program in increasing the number of trained OB/GYNs? If so, this should be listed as an aim.

We revised the aim sentence in the introduction as follows:

Response: The aim of this study is to evaluate the first five years of the HRH program from the program onset in the academic calendar years July 2012 to 2016, which ends in 2017, and its impact on access to care through examination of: 1) the number of trained Obstetrician Gynecologists graduated from the University of Rwanda and the University of Rwanda-HRH program and 2) a geospatial analysis of pregnant women's access to Rwandan public hospitals with trained Obstetrics and Gynecology providers.

What is the facility delivery rate currently in Rwanda? What about the percentage of pregnant women who utilize the public hospitals versus private clinics?

Methods

Line 310 - "malariaAtlas"

Response: We corrected this error. Thank you.

Can the authors elaborate more on the HRH Rwanda program? When was it started and what does the program entail? What is the structure of the residency program and how did the government-academic partnership work?

Response: We have provided a more clear description of the beginning date of the HRH Rwanda program. We now provide additional information on the duration and structure of the residency program. Given the space limitations we did not fully elaborate more on the program and direct readers to the references describing the program. We will also provide additional description on the Obgyn HRH academic program in a separate manuscript.

Can you describe the mean number of OB/GYNs per hospital? Were there more OB/GYN residents being trained every year? If so, how was this accomplished? Increased recruitment or financial incentives for physicians to pursue additional training? What about physician retention as you later reference in lines 377-378?

Response: The numbers per hospital are small (1-2 Ob/Gyns per hospital); we describe this fact in the manuscript. Yes, more Ob/Gyns were being trained, we also added a description of the incentives for trainees and physicians. Added slots in medical school and residency were the primary means of recruitment of new learners and trainees.

How did you measure the Rwandan OB/GYN workforce as described in your aim? Was this assessed through a medical council registry? Is there a national database to account for every single OB/GYN?

Response: We have added the following sentence to the Methods:

To determine the number of Rwandan Obstetrician Gynecologists graduated from the University of Rwanda and the University of Rwanda HRH program, we used the Rwandan Obstetrics and Gynecology Society (RSOG) database as well as graduation records from the University of Rwanda School of Medicine. The Rwandan Obstetrics and Gynecology Society maintains a current database of practice settings and locations for all Obstetrician Gynecologists in Rwanda.

Can you describe the way that physicians are employed in Rwanda? Are Rwandan physicians government employees who are deployed or assigned to certain hospitals? Or are physicians free agents who can sign a contract with any hospital? In other words, is the distribution of the OB/GYNs a result of an increased number of OB/GYNS and government policy to distribute the specialists, or are there other factors that encourages physicians to work in hospitals across the country?

Response: We provide a description of the employment and incentive structure in the manuscript.

Line 336 - These numbers are different than the numbers in your abstract. Please clarify.

Response: We corrected the discrepancy between the abstract and the manuscript.

Line 337 - missing a period

Response: we corrected this error.

Lines 338-340 - Can the authors clarify this statistic? In 2016, 99.6% of women lived within 2 hours of a hospital and 100% lived within one hour? The percentage should be less for one hour than two hours.

Response: Thank you. We have corrected this error.

Discussion:

Lines 348 - this is so important. I cannot agree more.

Response: Thank you for your comments.

Lines 398 - This may have be addressed in the methods section as I am not familiar with the R package that the authors used. Is the travel time calculated with the speed of a car? The reason that I ask is that most patients in rural areas may not have access to cars, and would rely on public transportation or hired taxis/motorbikes/bikes to access care. While the authors are correct that there are local impediments to travel, we cannot overlook that travel time can also be affected by economic status which is not measured.

Response: Travel time is estimated from the “friction” or “impedence” of a given pixel, which is estimated from data such as roads, land cover, and slope. Thus, travel time across a given pixel assumes a pixel will be traversed in the most efficient way possible, which for pixels with roads should be by car. But that, of course, doesn't mean individuals in the real world actually use a car within that sector, for instance short distance travel across a pixel with roads may well be on foot. However it *could* be by car, which would not be the case for a remote settlement with only access by foot. The travel time map, therefore, is most helpfully conceived as a kind of probability map, ie the probability is that travel will be more efficient in a given pixel.

Lines 416 - Nice conclusion. I still think the authors can consider moving their last paragraph from their introduction to here.

Reviewer #3: Dr. Small and her colleagues from HRH Rwanda have pulled together a very elegant analysis of the increase in trained OB/Gyns practicing in Rwanda as a direct result of this ambitious program. Not only do they demonstrate an increase in the quantity of Ob/Gyns but the geospatial analysis of where trained OB/gyns were practicing. A significant increase in the both the number and geographic distribution of Ob/Gyns in Rwanda.

I would argue that this manuscript is very relevant to the practicing US Ob/gyn as it demonstrated the unbelievable potential to help influence care for women globally when governments and institutions collaborate. I think publication in Obstetrics and Gynecology will be inspirational to the readership. The impact of HRH Rwanda on increasing access to OB/gyn specialty care is commendable, and hopefully sustainable and replicable.

The Figures are gorgeous.

Response: Thank you!

I have several suggestions to strengthen the manuscript.

More involved suggestions:

1) Overall, the manuscript could be trimmed in length, particularly the abstract, introduction and to a certain degree the discussion. I believe this will increase the audience that reads it (simple, elegant analysis, proving a point). For example, the details of the geospatial analysis need not be in the abstract. The discussion rambles a bit (odd subheading in the middle; paragraph starting at 409 may not be necessary).

Response: Thank you. We revised the discussion.

2) I would add into the methods the number of US OB/gyns and US institutions that contributed to the HRH program to demonstrate the investment on the US side to the training of these individuals. Some details on specialties, subspecialties 'deployed' and length of time in Rwanda, etc. I believe these details will be inspiring but also may give a sense of the scale required to replicate this model elsewhere.

Response: Thank you. We incorporated these descriptions in the introduction section.

3) Did the authors consider a geospatial analysis of the facilities in the public health system in parallel with the analysis of the access to an OB/gyn? To clarify, what proportion of women lived within 10 km or 25 km of a public health facility in the first place? Maybe the map of geographic distribution already as good as possible with the current distribution of facilities. E.g. if no facility there, hard to have the ob/gyn there. This analysis might help the Rwandan govt prioritize where to build new referral systems.

Response: We incorporated the population density in the new maps to highlight the location of facilities in relation to the population of pregnant women.

4) Please include the number of facilities where the ob/gyns are practicing. E.g. in 2011 there were 14. In how many possible facilities? Did the number of facilities increase in this time period

Response: We provided a description of the number of facilities (48) for the analysis.

5) Any sense of how the Rwandan government is incentivizing the spatial distribution of graduates? This is very impressive and not found in other SSA countries where most are concentrated in urban locations. Are there plans for retention of specialty trained MDs to prevent brain drain?
add sentence from NEJM paper on incentivization contracts

Minor suggestions:

There were a number of minor punctuation and plurality mistakes so a thorough re-read of the manuscript for this level of detail would be helpful.

- consider using language that the number of faculty increased, rather than the faculty increased (kept thinking of my own expanding waistline)

-line 155 syntax unclear (providers?)

Response: Thank you. We made these corrections.

-line 157—if going to quote the 95% CI of the difference, need to include the actual point estimate of the difference

We revised our statistical analyses. The 95% CI is not included in the updated analysis.

-line 151-152 are academic years the HRH program years?

Response: Yes, we have included a statement that the Rwandan residency program calendar is similar to the US academic calendar.

-line 184: add 'system' after medical education

Response: Thank you. We have made this correction.

-line 190-191 MDG sentence (remind audience what year these decreases were to be achieved, over what time frame, and consider adding how not many other SSA achieved this

Response: Thank you. We added this information

-line 198: professional should be plural

Response: We made this correction

-include clear dates of when HRH started in the introduction

Response: We have clarified the dates of the HRH program in the introduction

-line 218: spell out SSA

Response: We have spelled out Sub Saharan Africa. Thank you.

-were there targets for the number of residents trained? Did the 6-7/year meet or exceed these targets?

Response: We clarified information related to these goals in the discussion section

-did the trainees have to pay to be residents (as is common in nearby African nations)

Response: Residents are paid by the Rwandan Government. We included this information in the methods section.

"Residents receive salaries from the Rwandan Ministry of health"

-line 337 and 357- need punctuation

Response: Thank you.

-line 347— improved access to care (?add reproductive health before care)
-Could add to the discussion that only 5 years in and still need to prove that this is sustainable and that trained individuals won't disappear back to the major cities

Response: We left the terminology as 'access to care' because the Obgyn's role in Rwanda, like in the US, extends far beyond reproductive health alone and encompasses all aspects of health care for women. The reviewer makes an excellent point. Ensuring sustainability for rural communities could pose a challenge. The Rwandan government is committed to providing health care in rural communities—one mechanism for continuing to provide this coverage is with the requirement for residents from all specialties to contract with the MOH and serve in areas with designated needs. Physicians are given preferences for communities they wish to work in following graduation and many return to their rural, home communities to practice.

STATISTICAL EDITOR COMMENTS:

The Statistical Editor makes the following points that need to be addressed:

Results: Consider including a Table that summarizes the 2011 vs 2016 data in terms of (1) number of hospitals with OB/GYN coverage (2) proportion of country's area within 10 and 25 km and within 120 minute travel to a hospital with OB/GYN.

Fig 4: This map (and the previous maps of Rwanda) demonstrate the impact of provider/hospital locations on the geographic areas of the country, not on the population. Could a map be redrawn that would weight the areas of the country by their relative population? The proposition that "virtually all of the Rwanda population had less than a 120 minute travel time is not obvious from these maps. A better metric would be to describe the area included in the < 120 minute travel time as a % of the entire country and a description of the population included in that area vs the entire Rwandan population.

Response: We modified our maps to reflect population density. We superimposed the travel distance and travel time analysis on these new population density maps.

EDITOR'S COMMENTS:

1. Thank you for your submission to Obstetrics & Gynecology. In addition to the comments

from the reviewers above, you are being sent a notated PDF that contains the Editor's specific comments. Please review and consider the comments in this file prior to submitting your revised manuscript. These comments should be included in your point-by-point response cover letter.

The notated PDF is uploaded to this submission's record in Editorial Manager. If you cannot locate the file, contact Randi Zung and she will send it by email - rzung@greenjournal.org.

- The précis is a single sentence of no more than 25 words, written in the present tense and stating the conclusion(s) of the report (ie, the bottom line). The précis should be similar to the abstracts conclusion. Do not use commercial names, abbreviations, or acronyms in the précis. Précis should be the "hook" for people who scan the Table of Contents to see what to read.

Response: We modified the précis. It is no longer past tense and is 25 words in length.

Please read the instructions for authors for the Journal when you revise your paper to identify important formatting and other information.

For instance, in an original research paper, the abstract has certain headings and is limited to 300 words. Hard to count in a PDF but the abstract looks much longer than 300 words. I am not going to point out all of these sorts of formatting issue and will assume you will correct on revision.

- increased quality of and access to health care...

Response: We have reformatted and cut the abstract. The length is now 300 words.

- so your primary outcome was# of ob gyns? Please state your primary and secondary outcomes in your methods (and the manuscript) and report them in that order in the results sections.

Response: We clarified the aims and followed this order in the results section.

- is this raster or roster? I don't know what this is and perhaps others won't either. Could you state this in another way for the readership to know what it is?

Response: A raster dataset (spelled correctly with an *a*) is one of the two major formats for the digital representation of spatial data. A raster is essentially the same thing as a digital photograph or a digital radiologic study, in which there is a grid of equally sized pixels or cells in x-y coordinate space. In a geospatial raster the x-y coordinate space is specifically units of longitude and latitude within a spatial coordinate system. The size of each cell in a geospatial raster represents a real-world area, such as 1 square km. Each pixel in a raster has a numeric value. In the case of our study, each cell has an estimated count of pregnant women, which in turn is derived from population data. Thus, we have a continuous map of Rwanda with a grid of cells each representing the number of pregnant women per km².

- what is a buffer zone? Just the area within a circular of radius X around a hospital? what is it "buffering"?

Response: That is correct, a buffer zone is a circular zone with a prespecified radius around a given point (or drawn around sets of points). This is a common geospatial operation and in the standard lexicon of the field. For clarity we have rephrased the section as follows:

"To determine the proportion of pregnant women in Rwanda who were within a given distance of hospitals with Obstetrician Gynecologists, we computed 10 km and 25 km radius circles around hospital locations for both academic years, 2011 and 2016. This was accomplished using the "buffer" tool in ArcGIS."

- in the manuscript you will need to define for the readers, as noted by reviewers, what the health care system in Rwanda looks like. What does the non-public health care system look like and did you look at the consequences of that system? did all the residents trained during the program stay in the public sector?

Response: We clarified the structure of the public health system. All residents are trained in the public health system. We did not evaluate the private sector. We also clarified the post-residency graduation requirement that all residents commit at least 5 years to the public health sector following graduation.

- is the year 2011 similar to the designation of an academic year? Please state the actual months included to avoid misunderstanding.

Response: The years are academic years. We clarified this designation in the manuscript

- how many rwandan hospitals are there?

Response: We've reported the number of district and referral hospitals (48) during the study period.

- this sentence doesn't make sense.

Response: we revised the discussion for clarity

- is this a change?

- This is called a primacy claim: yours is the first, biggest, etc...In order to assert that, you need to provide the search terms used and the data base (s) searched (PubMed,GOogle Scholar, etc) to substantiate the claim in the manuscript. Otherwise, it needs to be deleted. It wouldn't belong in the abstract anyway, so make sure you address this in the manuscript body. Is it important that it's the first?

Response: we removed all claims of primacy from the manuscript

- The introduction should be about 1 page in length.

- you have made some good descriptions of what the results of the program were but almost no description of the components of the program. How did the program achieve these ends?

Response: A full description of the academic components involved in the program are beyond the scope of this paper. We plan to describe the HRH Rwanda OBGYN program in more detail in a separate manuscript.

We added the following sentences:

"The core goal of the HRH-Rwanda program is postgraduate academic training; US faculty supported this goal through clinical and pedagogical support. Previous works detail the formation of the HRH program and comprehensively evaluate its first 5 years."

- please use cesarean birth or delivery rather than section

Response: Thank you. We made this correction

- and medical education infrastructure? programs?

- health care professionals (plural)

Response: Thank you. We made this correction

- is this total?

- who designed it?

- spell out throughout

- For those not aware of the organization of health care services (especially ob gyn services) please provide a brief overview of the state of things: public v private; tertiary v district hospitals; clinics, etc.

Response: We described the Rwandan health system in more detail.

- please clearly state your primary and secondary outcomes. Then, organize your methods, results and discussion sections in order of primary, then secondary outcomes.

Response: We rearranged our methods and results to reflect the primary and secondary aims

- To be very clear, you are just focusing on emergency OB services in this study? That it what lie 241-2 would suggest.

Response: We revised all wording suggesting the study is limited to only emergency OB services. We emphasized the importance of having obgyns to address emergency obstetric conditions as a key component to maternal mortality reduction. Obgyns, however, also address a number of benign Gyn and medical conditions across the lifespan.

- primary issue again.

- Somewhere you need to tell us what the HRH actually did. Were there more teaching facilities or did the only teaching hospital increase the number of trainees? If a country leadership were reading this paper and wanted to try to replicate it, what steps were involved?

Response: The University of Rwanda is the only institution for academic residency training and the two major teaching hospitals in Butare and Kigali remained constant.

--Similar to US training sites, the other clinical rotations varied based on the number of residents, adequacy of teaching supervision and clinical volume.

--Additional positions were made available in medical schools as well as in residency programs; HRH faculty supported the academic goal to train these learners.

We have revised the text as follows:

"The core goal of the HRH-Rwanda program is postgraduate academic training; US faculty supported this goal through clinical and pedagogical support. Many of the academic approaches were innovative and actively incorporated simulations, skills assessments and oral examinations in addition to traditional didactics and clinical teaching. Previous works detail the formation of the HRH program and comprehensively evaluate its first 5 years."

We feel a more detailed description of the HRH Obgyn program and its challenges will be important. We will present this information in a forthcoming manuscript.

- please eliminate section headings other than introduction, materials, results, discussion

Response: We eliminated additional section headings

- Would a graphic help depict this for those uncertain about what is meant? For instance, how many health posts are there that are supported by a district hospital? What kind of services are available at a health post.

Response: We provided additional information about the Rwandan public health system and the services offered in the different centers.

- antepartum care only or does this include intrapartum care?

Response: We deleted this terminology

- The Journal style doesn't not use the virgule (/) except in numeric expressions. Please edit here and in all instances.

We eliminated the virgule throughout the document

- how many are there?

- does this mean that someone in one of this centers used GPS to obtain these coordinates? was this specifically done for this study or known otherwise?

- as noted above, this needs more explanation.

- somewhere, please make it clear how the so-called buffer zones which are distance relate to the population levels of births (so that you can draw conclusions about distance from hospitals for women giving birth). Its not clear.

- this requires further explanation. What data supported the number of pregnant women (or reproductive age women?) in these different radii?

Response: Thank you. We believe we addressed these concerns in the earlier responses.

- is this all travel by car?

Response: Travel time is estimated from the "friction" or "impedence" of a given pixel, which is estimated from data such as roads, land cover, and slope. Thus, travel time across a given pixel assumes a pixel will be traversed in the most efficient way possible, which for pixels with roads should be by car. But that, of course, doesn't mean individuals in the real world actually use a car within that sector, for instance short distance travel across a pixel with roads may well be on foot. However it *could* be by car, which would not be the case for a remote settlement with only access by foot. The travel time map, therefore, is most helpfully conceived as a kind of probability map, ie the probability is that travel will be more efficient in a given pixel.

- somewhere, please provide the overall population of Rwanda in the 2 time periods and the number of births.

Response: We added a description of the population in the introduction. We used at 2015 population database for all geospatial analyses. We added the annual births for 2015 to the methods section.

How many medical schools are there or centers which train residents?

Response: We added a sentence to the methods, "The University of Rwanda is the only institution providing residency education."

- You could combine this sentence with the one previously--Like: Prior to the initiation of the program, In the 7 years preceding the program, 18 residents completed training or 2.6 residents/year.

Response: Thank you, we revised this section

This increased by 2.6

fold to 66 residents (33 total) in the years 2012-2017). By faculty, do you mean OBGYN faculty

Response: We specified obgyn faculty

- please note how this is a change. Were expats the previous heads of department

or were they non obgyns?

Response:

We revised the text as follows:

"The number of Rwandan faculty increased by 45%. University of Rwanda-HRH graduates now head 75% of referral hospital Obstetrics and Gynecology departments; others head provincial and district hospitals (Figure 2). These new leaders from the University of Rwanda-HRH program represent recent graduates in the subspeciality of Obstetrics and Gynecology. As the only residency trained Obstetrician Gynecologists in many hospitals, they have assumed leadership roles. The district hospitals represented in this analysis now have at least 1 to 2 obstetrician gynecologists; the two largest tertiary care academic referral centers possess highest numbers of obstetrician gynecologists per institution."

- please tell us somewhere how many Rwandan hospitals there are.

Response: We added this information to the introduction

- Line 330 to 333 can be combined. Please tell us how geospatial analysis is necessary for this. Since there were only 14 ob gyns during this time frame, did you need this sort of analysis to say this to be the fact? How many of the 14 were in either Kigali or Butare?

Response: We clarified that all providers were in either Kigali or Butare in 2011.

- in all cases, please provide statistical data to support that this represents a difference.

Response: We revised the results.

- other than Ob GYN health care professionals, were there other areas involved?

Response: We expanded the description of the program in the introduction. We refer to other specialties involved.

- 14 to 49 is much more than a near doubling. Please clarify.

Response: Thank you! We have revised the sentence to read:

"Training efforts generated by US and Rwandan academicians resulted in a nearly four-fold increase in the number of Obstetrician Gynecologists in a 5-year period."

- how so? you are training about 7 per year. Its 2019 and you had 49 in 2016. How will this reach 100 next year?

Response: Overall, approximately 7 are graduating per year, however, the total number of obgyn residents graduated will approximate 100 by 2020.

For clarity, we revised the sentence to read,

"Since 2005, the University of Rwanda and University of Rwanda HRH program graduated 74 residents in Obstetrics and Gynecology. The district and teaching hospitals are close to these metrics."

- Specifically, this does not relate to reaching our goals of 100 by 2020...it relates to proximity of pregnant women to providers...these are related but not the same.

Response: We reworded the discussion in order to clarify and focus on the aims of increasing the proximity of women to providers as well as increasing the number of obgyns.

- Don't just repeat your results---put this in context.

Response: Thank you. We revised the discussion accordingly.

- Please be very careful on your revision to address this sort of problem, which is common in your manuscript.

There is no punctuation between sentences here.

Response: Thank you. We corrected this error.

- similar to the US

- i don't understand this sentence.

Response: We revised the discussion section for clarity.

This section now reads,

"At the onset of the HRH Rwanda program, all Obstetrician Gynecologists were located in the two largest cities, the capital city Kigali, and the southern city of Butare. Butare is the second largest city in Rwanda and the site of the University of Rwanda medical school campus. This rural/urban disparity in the geographic distribution of obstetrician gynecologists was reduced as an result of the HRH program."

- true for high income countries too.

- Universal access to health care?

Response: Yes! we corrected the language, 'universal access to health' and made it, 'universal access to health CARE. Thank you.

- please show us where Kigali and Butare are.

Response: We added 'Kigali' and Butare' to the map for orientation

- what percent of the births lie outside these areas?

Response: We report on the percentage of attended births occurring in rural and urban settings. We did not have access to demographic information describing the percentage of births occurring outside the specific hospitals described in this analysis.

2. 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.

Response: yes

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

3. As of December 17, 2018, Obstetrics & Gynecology has implemented an "electronic Copyright Transfer Agreement" (eCTA) and will no longer be collecting author agreement forms. When you are ready to revise your manuscript, you will be prompted in Editorial Manager (EM) to click on "Revise Submission." Doing so will launch the resubmission process, and you will be walked through the various questions that comprise the eCTA. Each of your coauthors will receive an email from the system requesting that they review and electronically sign the eCTA.

Any author agreement forms previously submitted will be superseded by the eCTA. During the resubmission process, you are welcome to remove these PDFs from EM. However, if you prefer, we can remove them for you after submission.

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.

We added this statement to the cover letter.

5. Have any of the figures been previously published in another source? If yes, written permission of the copyright holder must be obtained. Permission is also required for material that has been adapted or modified from another source. Both print and electronic (online) rights must be obtained from the holder of the copyright (often the publisher, not the author), and credit to the original source must be included in your manuscript. Many publishers now have online systems for submitting permissions request; please consult the publisher directly for more information.

Response: The figures have not been previously published.

6. All submissions that are considered for potential publication are run through CrossCheck for originality. The following lines of text match too closely to previously published works. Variance is needed in the following sections:

LINE 273-74: Citation needed ("The Rwandan Public Health...and referral hospitals").

Response: Thank you. We provided citations for this section.

7. Please submit a completed STROBE checklist.

Response: We have completed the STROBE checklist

Responsible reporting of research studies, which includes a complete, transparent, accurate and timely account of what was done and what was found during a research study, is an integral part of good research and publication practice and not an optional extra. Obstetrics & Gynecology supports initiatives aimed at improving the reporting of health research, and we ask authors to follow specific guidelines for reporting randomized controlled trials (ie, CONSORT), observational studies (ie, STROBE), meta-analyses and systematic reviews of randomized controlled trials (ie, PRISMA), harms in systematic reviews (ie, PRISMA for harms), studies of diagnostic accuracy (ie, STARD), meta-analyses and systematic reviews of observational studies (ie, MOOSE), economic evaluations of health interventions (ie, CHEERS), quality improvement in health care studies (ie, SQUIRE 2.0), and studies reporting results of Internet e-surveys (CHERRIES). Include the appropriate checklist for your manuscript type upon submission. Please write or insert the page numbers where each item appears in the margin of the checklist. Further information and links to the checklists are available at https://urldefense.proofpoint.com/v2/url?u=http-3A__ong.editorialmanager.com&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcsiEgHoG1i6YHLR0Sj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOfl4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=YDaGyM6q_XSbxOW13kUR3ZJvTXvnQsoyrLuNvr1umvg&e=. In your cover letter, be sure to indicate that you have followed the CONSORT, MOOSE, PRISMA, PRISMA for harms, STARD, STROBE, CHEERS, SQUIRE 2.0, or CHERRIES guidelines, as appropriate.

8. 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 and gynecology data definitions at https://urldefense.proofpoint.com/v2/url?u=https-3A__www.acog.org_About-2DACOG_ACOG-2DDepartments_Patient-2DSafety-2Dand-2DQuality-2DImprovement_reVITALize&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcsiEgHoG1i6YHLR0Sj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOfl4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=-moVXDEftSG_IFvm3svWR9TxL10sSkju5F89p0wMJMY&e=. If use of the reVITALize definitions is problematic, please discuss this in your point-by-point response to this letter.

9. 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 26 typed, double-spaced pages (6,500 words). Stated page limits include all numbered pages in a manuscript (i.e., title page, précis, abstract, text, references, tables, boxes, figure legends, and print appendixes) but exclude references.

10. 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).**
We included a sentence stating,

Response: "This study was an oral presentation at Society for Maternal Fetal Medicine 2018: 39th Annual Meeting: The Pregnancy Meeting in Las Vegas Nevada."

11. Was this presented at the FIGO World Congress of Gynecology & Obstetrics? If so, please note the name, location, and dates of the meeting on the title page of your manuscript.

Response: This abstract was withdrawn from FIGO Brazil, 2018. Unfortunately, cost prohibited us from presenting several abstracts from Rwanda. Presenters were only able to present one abstract and were required to pay the registration fee for each abstract presented. Many of our residents wanted their works presented but were unable to pay conference registration fees or travel to Brazil. We, therefore decided to withdraw this abstract and several others. This abstract was subsequently submitted and accepted as an oral presentation to the 2019 SMFM Pregnancy Meeting in Las Vegas, NV. Several other works from research conducted through the HRH-University of Rwanda Obgyn group were also presented at the 2019 SMFM Pregnancy Meeting.

12. Provide a précis on the second page, for use in the Table of Contents. The précis is a single sentence of no more than 25 words that states the conclusion(s) of the report (ie, the bottom line). The précis should be similar to the abstract's conclusion. Do not use commercial names, abbreviations, or acronyms in the précis. Please avoid phrases like "This paper presents" or "This case presents."

Response: We have provided a precis on the second page.

13. 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.

Response: We cut the abstract length to 300 words and provided a word count

14. Only standard abbreviations and acronyms are allowed. A selected list is available online at https://urldefense.proofpoint.com/v2/url?u=http-3A_edmgr.ovid.com_ong_accounts_abbreviations.pdf&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcSiEgHoG1i6YHLROsj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOFI4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=TIq4nOejuLTmMKbFTi7su0G8gO9q45qMOoR_r aSA-1g&e=. 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.

15. 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.

Response: We eliminated the virgule symbol from this manuscript.

16. Line 170: 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.

Response: We eliminated all claims of first report.

17. Please review the journal's Table Checklist to make sure that your tables conform to journal style. The Table Checklist is available online

here: https://urldefense.proofpoint.com/v2/url?u=http-3A_edmgr.ovid.com_ong_accounts_table-5Fchecklist.pdf&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcSiEgHoG1i6YHLROsj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOFI4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=-zORjLLurufWOy5eaACGRfCwgU_zbqVj0oCEU888gVM&e=.

We have not included any tables in the manuscript.

18. Figures 1-4: Please upload each figure as a separate file to Editorial Manager (do not embed the figure in your manuscript file).

Figure 1: Please submit the figure in the original file format it was created in. Copying and pasting the image into MS Word reduced the resolution.

Response: We provided a separate file for all images. In the marked copy, we added the figures so reviewers could more easily see the revised maps.

Figure 2: Please include a legend or footnote to indicate that the H graphic denotes a hospital.

Response: We described the "H" graphic in the figure title.

Figure 3: The picture of Africa needs to be labeled. It may also make more sense to have it with Figure 2, to show context of where the country is located within the continent. The "Zone Around Hospital" text can probably be deleted since it is explained in the legend.

Response: We deleted this map of Africa and the 'zone around hospital' text.

Figure 4: Please submit the figure in the original file format it was created in. Copying and pasting the image into MS Word reduced the resolution.

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 https://urldefense.proofpoint.com/v2/url?u=http-3A__links.lww.com_LWW-2DES_A48&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcsiEgHoG1i6YHLR0Sj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOFI4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=p-0vE9mQB7NO-ESo3kUgM9XqyKdKYZmFP5i9v2iCMIw&e=. The cost for publishing an article as open access can be found at https://urldefense.proofpoint.com/v2/url?u=http-3A__edmgr.ovid.com_acd_accounts_ifauth.htm&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcsiEgHoG1i6YHLR0Sj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOFI4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=RkuWfrjairiPsnxYXWymIbLOmLdaEMY_LptxgIIOPPU&e=.

Please note that 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.

20. If you choose to revise your manuscript, please submit your revision via Editorial Manager for Obstetrics & Gynecology at https://urldefense.proofpoint.com/v2/url?u=http-3A__ong.editorialmanager.com&d=DwIGaQ&c=imBPVzF25OnBgGmVOlcsiEgHoG1i6YHLR0Sj_gZ4adc&r=uLVdozWdJxf6vIS80raSxfrI2PTdLOe6An50gAIOFI4&m=XGqGpH8HIwg90Jdl6Ro6jWqivTcf_S67HrGWTMjJqUg&s=YDaGyM6g_XSbxOW13kUR3ZJvTXvnQsoyrLuNvr1umvg&e=. 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 and that each author has given approval to the final form of the revision.

Again, your paper will be maintained in active status for 21 days from the date of this letter. If we have not heard from you by Mar 14, 2019, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,

Nancy C. Chescheir, MD
Editor-in-Chief

From: [REDACTED]
To: [Randi Zung](#)
Subject: Re: Your Revised Manuscript 19-252R1
Date: Monday, April 1, 2019 12:25:10 PM

Thanks!

The new sentence will read,

“The 14 district hospitals represented in this analysis now have at least 1 to 2 obstetrician gynecologists; the two largest tertiary care academic referral centers possess the highest numbers of obstetrician gynecologists per institution.”

Should I add this number to the manuscript and return or will this be sufficient?

Thanks!

Maria J. Small MD, MPH

From: Randi Zung <RZung@greenjournal.org>
Sent: Monday, April 1, 2019 10:56:40 AM
To: Dr Maria Small, M.D.
Subject: RE: Your Revised Manuscript 19-252R1

Dear Dr. Small:

It appears that your line numbering does not match what we see at the office. I am attaching a PDF so you can see where the comment should appear.

The sentence that Dr. Chescheir is referring to is, “The district hospitals represented in this analysis now have at least 1 to 2 obstetrician gynecologists; the two largest tertiary care academic referral centers possess the highest numbers of obstetrician gynecologists per institution.”

Thank you,
Randi Zung

From: Dr Maria Small, M.D. [REDACTED]
Sent: Thursday, March 28, 2019 3:40 PM
To: Randi Zung <RZung@greenjournal.org>
Subject: Re: Your Revised Manuscript 19-252R1

Hi,
Thank you very much for the prompt response!


I am addressing the queries now, but am not clear which estimate the editors refer to in line 349.

the line reads, " distribution of women of child bearing age, age-specific fertility rates, still birth and abortions".

Can you provide additional clarification of which estimate is needed?

Thank you very much,
Sincerely,
Maria Small

Maria J. Small MD, MPH



From: Randi Zung <RZung@greenjournal.org>

Sent: Thursday, March 28, 2019 2:04 PM

To: Dr Maria Small, M.D.

Subject: Your Revised Manuscript 19-252R1

Dear Dr. Small:

Your revised manuscript is being reviewed by the Editors. Before a final decision can be made, we need you to address the following queries. Please make the requested changes to the latest version of your manuscript that is attached to this email. **Please track your changes and leave the ones made by the Editorial Office.** Please also note your responses to the author queries in your email message back to me.

1. General: The Editor has made edits to the manuscript using track changes. Please review them to make sure they are correct.
2. Title: The Editors would like to make it clear that access was increased in Rwanda, as opposed to the US.
3. The following co-authors will need to complete our electronic Copyright Transfer Agreement, which was sent to them through Editorial Manager.

Eugene Ngabonziza
Stephen Rulisa

4. Did you present at the 2018 meeting, which was the 38th annual meeting, or the 2019 meeting, which was the 39th? Please correct as needed and add the dates (January 29 - February 3, 2018, or February 11 - 16, 2019).

5. **Precis:** Similar to the title, the Editors would like to make it clear that access was increased in Rwanda, as opposed to the US.
6. **Abstract-Methods:** Add the type of study you conducted to this section.
7. Line 262: ends or ended?
8. **Abstract-Method:** Add the type of study you conducted to this section.
9. Line 349: Do you have an estimate to provide here?
10. Line 353: Your figures have been renumbered, both here and in the legends. Please check both places to make sure the figures are correctly cited.
11. Line 363: Is this the correct citation based on the way the figures were renumbered? No original figure 4 was provided with your revised manuscript.
12. Line 404 and elsewhere: The Journal style doesn't not use the virgule (/) except in numeric expressions. Please edit here and in all instances.
13. **Figures:** Your figures have been renumbered, both here in the legends and in the text. Please check both places to make sure the figures are correctly cited.
14. **Figure 2:** Please confirm that the legend shown here is correct. Additionally, this figure cites the following as the source:

"Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS AeroGRID, IGN, and the GIS User Community"

Please provide permission from the owner/creator of the figure to use it in your article, both in print and online use.

15. **Figure 3:** This figure cites www.worldpop.org. Please provide permission from the owner/creator of the figure to use it in your article, both in print and online.

To facilitate the review process, we would appreciate receiving a response by April 1.

Best,
Randi Zung

--

Randi Zung (Ms.)

Editorial Administrator | *Obstetrics & Gynecology*
The American College of Obstetricians and Gynecologists
409 12th Street, SW
Washington, DC 20024-2188
T: 202-314-2341 | F: 202-479-0830
<http://www.greenjournal.org>

3/28/2019

Dear Editors,

Thank you for considering our revised manuscript for publication. We have addressed the editor queries below.

Sincerely,
Maria Small

Please make the requested changes to the latest version of your manuscript that is attached to this email. **Please track your changes and leave the ones made by the Editorial Office.** Please also note your responses to the author queries in your email message back to me.

We have tracked changes in the new manuscript and resubmitted the original Figures 4 (4ab and 4bc) and 5.

We reviewed the Editors changes and agree with them. Thank you!

1. General: The Editor has made edits to the manuscript using track changes. Please review them to make sure they are correct.

Agree

2. Title: The Editors would like to make it clear that access was increased in Rwanda, as opposed to the US.

The title is much clearer. Thank you.

3. The following co-authors will need to complete our electronic Copyright Transfer Agreement, which was sent to them through Editorial Manager.

My co-authors in Rwanda agree to submit their agreements today.

Eugene Ngabonziza—needs the link resent---the last link is not functioning for him. He has tried to submit his agreement (he is an ob-gyn resident and is working with a faculty co-author who successfully submitted their form) but they cannot make it work.

Stephen Rulisa

4. Did you present at the 2018 meeting, which was the 38th annual meeting, or the 2019 meeting, which was the 39th? Please correct as needed and add the dates (January 29 - February 3, 2018, or February 11 - 16, 2019).

We presented in 2019 and made this change in the manuscript. Thank you.

5. Precis: Similar to the title, the Editors would like to make it clear that access was increased in Rwanda, as opposed to the US.

Thank you.

6. Abstract-Methods: Add the type of study you conducted to this section.

We added the type of study to 'cross-sectional' in the abstract and in the methods section.

7. Line 262: ends or ended?

We changed the sentence to 'ended'. Thank you.

8. Abstract-Method: Add the type of study you conducted to this section.

We changed the type of study to cross-sectional in two time points in the methods section.

9. Line 349: Do you have an estimate to provide here?

We were not sure which estimate is referred to in this query.

10. Line 353: Your figures have been renumbered, both here and in the legends. Please check both places to make sure the figures are correctly cited.

The changes in figure citation look good.

11. Line 363: Is this the correct citation based on the way the figures were renumbered? No original figure 4 was provided with your revised manuscript.

We will resubmit original figures 4 and 5 for clarity.

12. Line 404 and elsewhere: The Journal style doesn't not use the virgule (/) except in numeric expressions. Please edit here and in all instances.

We apologize for this error and have made the corrections!

13. Figures: Your figures have been renumbered, both here in the legends and in the text. Please check both places to make sure the figures are correctly cited.

The figures are correctly cited.

14. Figure 2: Please confirm that the legend shown here is correct. Additionally, this figure cites the following as the source:

The figures are correctly cited.

"Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS AeroGRID, IGN, and the GIS User Community"

Please provide permission from the owner/creator of the figure to use it in your article, both in print and online use.

The basemap source data is cited. We added the citation and web address for the citation. The figures are ours.

15. Figure 3: This figure cites www.worldpop.org. Please provide permission from the owner/creator of the figure to use it in your article, both in print and online.

The figures are ours and are produced by us. The source data is cited in the caption. The population data source is world pop and the reference to world pop is cited in the manuscript. The world pop data are open access.

To facilitate the review process, we would appreciate receiving a response by April 1.

From: [REDACTED]
To: [Denise Shields](mailto:DS Shields@greenjournal.org)
Subject: Re: figures in your Green Journal manuscript (19-252)
Date: Monday, April 8, 2019 11:26:29 AM

Looks good!

Sent from my iPhone

On Apr 8, 2019, at 11:23 AM, Denise Shields <DS Shields@greenjournal.org> wrote:

Hi Dr. Small,

Does the figure look okay?

Thank you,
Denise

From: Denise Shields
Sent: Wednesday, April 3, 2019 3:17 PM
To: 'Dr Maria Small, M.D.' [REDACTED]
Subject: RE: figures in your Green Journal manuscript (19-252)

Hi Dr. Small,

Here is the edited version of figure 1. Was there another message that you sent me? You said, "I have also attached..." but this is the only message I received.

Please let me know if this figure and the legend is okay.

Thank you,
Denise

From: Dr Maria Small, M.D. [REDACTED]
Sent: Wednesday, April 3, 2019 12:09 PM
To: Denise Shields <DS Shields@greenjournal.org>
Subject: Re: figures in your Green Journal manuscript (19-252)

Hi,

I have also attached another version of Figure 1 for consideration. The yellow boxes are smaller and only enclose the years. If this version appears clearer, it can be substituted for the earlier version.

Have the editors made a final decision on the manuscript?

Thank you again for your consideration!

Sincerely,

Maria J. Small MD, MPH
Associate Professor Obstetrics & Gynecology and Medicine
Division of Maternal Fetal Medicine
Duke University Medical Center Box 3967
Durham, NC 27701
(O) 919-668-0011

From: Denise Shields <DShields@greenjournal.org>

Sent: Tuesday, April 2, 2019 9:20 AM

To: Dr Maria Small, M.D.

Subject: figures in your Green Journal manuscript (19-252)

Dear Dr. Small,

Your figures and legend have been edited and they are attached for your review. Please review the attachments CAREFULLY for any mistakes.

Thank you for explaining to Randi Zung that figures 2 and 3 were created by you. We have removed “Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS AeroGRID, IGN, and the GIS User Community” from figure 2, and www.worldpop.org from figure 3. Please let me know if this information should be included in the legend.

Would you indicate what the yellow boxes are in figure 1 legend?

PLEASE NOTE: Any changes to the figures must be made now. Changes made 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 appreciate a reply no later than Friday, 4/5. Thank you for your help.

Best,

Denise

Denise Shields
Senior Manuscript Editor
Obstetrics & Gynecology
www.greenjournal.org

Find us social media:

Twitter (<https://twitter.com/greenjrnl>)

Facebook (<https://www.facebook.com/greenjournal/>)

Instagram (<https://www.instagram.com/greenjrnl/>)

LinkedIn (<https://www.linkedin.com/groups/4058408>)

<19-252R1 figure 1 (04-03-19 v4).pdf>