PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (http://bmjopen.bmj.com/site/about/resources/checklist.pdf) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

| TITLE (PROVISIONAL) | An insight into Nigeria’s progress towards the universal coverage of reproductive, maternal, newborn, and child health services: a secondary data analysis |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| AUTHORS             | Mafiana, Joy; Shen, Xiping; Hu, Wenping; Wang, Xiaohui                                                                                  |

VERSION 1 – REVIEW

| REVIEWER           | Colomé-Hidalgo, Manuel  
|                   | Universidad Rey Juan Carlos |
| REVIEW RETURNED   | 13-Mar-2022 |

GENERAL COMMENTS

This study addresses Nigeria's progress towards universal health coverage. The study shows how the country should establish measures to improve coverage in women and children, especially in times of COVID-19

GENERAL FEATURES

1. The manuscript needs to improve the writing in the English language.

2. The writing should be improved in a general sense, avoiding redundant words

3. Define the acronyms only if they will be used more than once in the manuscript

RESUME

4. It should be clearer. It has unnecessary words and sections. Given the characteristics of the study, I suggest reformulating it to structure the abstract in a way that makes it easier to read and conveys the general idea of the study.

5. If the authors used the HEAT software, then it is disaggregated data, please check appropriately.

6. The summary does not specify which statistical analysis measures were used, nor do they set considerations for accepting or rejecting hypotheses.

INTRODUCTION

7. More up-to-date universal health coverage targets and data exist and can be found at the following link: https://cdn.who.int/media/docs/default-source/world-health-data-platform/events/tracking-universal-health-coverage-2021-global-monitoring-report_uhc-day.pdf?sfvrsn=fd5c65c6_5&download=true
8-Reference 8-12 does not support the statement to which the authors refer. I recommend including a study that concludes this or an official report. Accessing the UNICEF data set implies that the reader has to do their own analysis to reach this conclusion.

METHODS
9-The authors used disaggregated data as well. Please review appropriately. All links to databases should redirect directly to the original source used to carry out the study, not to the general web portal.

10-The authors should update the data or write a justification that allows readers to understand the selection of the study period, since there are more recent published data. Something that can be verified in the following links:
https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NG
https://www.who.int/publications/i/item/9789240040618

11-It is necessary to delve into the level of detail of the variables shown in Table 1. For example, according to the cited source, the variable "Health expenditures" has different categories, which are not properly detailed.

12-Line 55 p8 explains that it is intended to study inequalities before and after the adoption of the universal health strategy; however, there is no bibliographic reference that explains this cut-off point. It is not clear to us what date he refers to. Later on line 47 of page 9 it is explained it was in 2015 but the way everything is written makes it very difficult to understand the time sequence.

13-I wonder why the authors did not use the composite coverage index as a variable for monitoring universal health coverage

14-Why didn't they use complex inequality measurement measures such as the slope inequality index and the concentration index? Simple measures of inequality (absolute and relative) do not take extreme values into account.

RESULTS
15-The tables must have a legend

16-The writing of the results does not provide a deep level of analysis, beyond what is already expressed in the tables and figures.

DISCUSSION
17-The use of the composite coverage index can contribute to support the discussion, as well as the use of complex measures of inequality.

18-Some of the conclusions are based on data that were current at that time and that, probably, if a reanalysis is done with updated information, a change can be observed.

19-Study limitations should be better explained within the discussion of the article.

BIBLIOGRAPHY
20-Some references do not have invalid links NO. 6-8-25 and others. Others do not have access to the clear and complete document Ref. No. 5 and others.

21-References must be appropriate to the style of the journal

REVIEWER
Crowell, Nancy
Georgetown University, Nursing and Health Studies

REVIEW RETURNED
14-Mar-2022

GENERAL COMMENTS
Overall an important topic. Manuscript is well-written and notes appropriate limitations. The manuscript needs to be thoroughly checked to ensure that when percentage points are being mentioned, they are not labeled as percentages. There is a big difference in percentage increase and percentage point increase. Percentage point increases/decreases are inconsistently labeled – sometimes referred to as just % and sometimes %-point. Make sure ALL are appropriately labeled as %-point. I have noted the places where I saw this below:

Abstract: All the % increases mentioned should be %-point increases.

Page 6, lines 16 and 18 – while perhaps justified, the use of the words “horrific” and “appalling” are emotionally laden and inappropriate in a scientific article.

Page 6, line 27 – typo replace “furthered” with “further”

Page 14 – Table 3 – heading for Difference between coverage in latest year and 2015 should indicate % points, not just %. This is done in the text, but not in the table heading. Same for difference between 2018 and 80% heading.

Page 16, lines 46-48: again it is percentage points not percent – so 13.3%-point and 26.8%-point.

Page 18, line 3: 23.2%-point

Page 18, line 27 “recommended by WHO” – add word by to sentence

The proof had the figure captions but not the figures – would have been good if reviewers could see the figures.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Dr. Manuel Colomé-Hidalgo, Universidad Rey Juan Carlos, Instituto Tecnologico de Santo Domingo

Comments to the Author:
This study addresses Nigeria’s progress towards universal health coverage. The study shows how the country should establish measures to improve coverage in women and children, especially in times of COVID-19

GENERAL FEATURES
1-The manuscript needs to improve the writing in the English language. Thank you for your comment, the manuscript has been revised as suggested.

2-The writing should be improved in a general sense, avoiding redundant words. Thank you for your comment, the manuscript has been revised as suggested.

3-Define the acronyms only if they will be used more than once in the manuscript. Thank you for your comment, the manuscript has been revised as suggested.

RESUME

4-It should be clearer. It has unnecessary words and sections. Given the characteristics of the study, I suggest reformulating it to structure the abstract in a way that makes it easier to read and conveys the general idea of the study. Thank you for your comment, unnecessary words and sections specifically in the methods and results sections have been removed. Please refer to page 6 line 54 to 60, page 7 line 4 to 16, page 10 line 17 to 60 and page 12 line 4 to 33. The structure of the abstract is in line with the journal's submission format; meanwhile, the authors have revised some details of the abstract for clarity in page 2 line 11 to 18 and 33 to 49.

5-If the authors used the HEAT software, then it is disaggregated data, please check appropriately. Thank you for your comment, the authors stated that the data were disaggregated by economic status, educational status, and place of residence. However, they excluded the subnational dimension due to limited data. Kindly refer to page 7 line 36 to 45.

6-The summary does not specify which statistical analysis measures were used, nor do they set considerations for accepting or rejecting hypotheses. Thank you for your comment. The summary has been revised to show that descriptive and absolute inequality analysis were conducted. Likewise, the study utilized a descriptive observational design as shown in page 2 line 11 to 17.

INTRODUCTION

7-More up-to-date universal health coverage targets and data exist and can be found at the following link: https://cdn.who.int/media/docs/default-source/world-health-data-platform/events/tracking-universal-health-coverage-2021-global-monitoring-report_uhc-day.pdf?sfvrsn=fd5e65c6_5&download=true Thank you for your comment, the data included in the study has been updated as suggested. Please refer to table 1 (page 8), table 3 (page 11) and table 4 (page 13).

8-Reference 8-12 does not support the statement to which the authors refer, I recommend including a study that concludes this or an official report. Accessing the UNICEF data set implies that the reader has to do their own analysis to reach this conclusion. Thank you for your comment, the references have been updated. Please refer to reference 12, 13 and 14 in page 5 line 8 and 12.

METHODS

9-The authors used disaggregated data as well. Please review appropriately. All links to databases should redirect directly to the original source used to carry out the study, not to the general web portal. Thank you for your comment, we have revised the statement for clarity in page 7 line 36 to 43. Also, all the links to the databases have been updated in table 1 (page 8) and page 25 line 3 to 33.
The authors should update the data or write a justification that allows readers to understand the selection of the study period, since there are more recent published data. Something that can be verified in the following links:
https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NG
https://www.who.int/publications/i/item/9789240040618
Thank you for the linkage you offered, we have updated the data used in our study as shown in table 1 (page 8), table 3 (page 11) and table 4 (page 13). The justification can be found in page 7 line 12 to 14.

It is necessary to delve into the level of detail of the variables shown in Table 1. For example, according to the cited source, the variable "Health expenditures" has different categories, which are not properly detailed.
Thank you for your comment, the categories of health expenditures have been properly reported as shown in page 8 (table 1).

Line 55 p8 explains that it is intended to study inequalities before and after the adoption of the universal health strategy; however, there is no bibliographic reference that explains this cut-off point. It is not clear to us what date he refers to. Later on line 47 of page 9 it is explained it was in 2015 but the way everything is written makes it very difficult to understand the time sequence.
Thank you for your comment. A bibliographic reference (reference 51 and 53) has been included to the statement in page 7 (outcome measures) line 21 to 27. The authors were explaining one of the outcomes of interest of the study which is the comparison of inequality before and after UHC adoption. The assessment of inequality before and after UHC adoption was conducted along with our assessment of the level of coverage of RMNCH services after UHC adoption. The authors have revised the statement for clarity in page 7 line 20 to 27 and line 32 to 45.
In line 47 page 9 (currently in page 9 line 35 to 52), the authors were reporting only the methods used in determining improvements in the national coverage after the policy was adopted in 2015. The authors have revised the statement for clarity as shown in page 9 line 35 to 52.

I wonder why the authors did not use the composite coverage index as a variable for monitoring universal health coverage
This study investigated the progress made towards the universal coverage of RMNCH services by also describing the coverage trends of the indicators before and after UHC adoption to observe the pattern of service delivery for each indicator in the country (Please refer to figure 1). The composite coverage index is a weighted average of eight indicators based on primary data from Demographic and Health Surveys or Multiple Indicator Cluster Surveys. It was not used in the study due to limited data source for most of the indicators.

Why didn’t they use complex inequality measurement measures such as the slope inequality index and the concentration index? Simple measures of inequality (absolute and relative) do not take extreme values into account.
Thank you for your comment, this study assessed inequality across different equity dimensions that consists of different subgroups (economic status: 5 subgroups, educational status: 3 subgroups and place of residence: 2 subgroups). The slope inequality index and the concentration index can only be calculated for dimensions with more than two subgroups. However, based on your suggestions, we have included the population attributable risk measure which is a complex measure that can be conducted for dimensions with 2 subgroups as shown page 10 line 7 to 13.

RESULTS
The tables must have a legend
Thank you for your comment, legends have been included in all the tables (Please refer to page 8 line 54 to 58 (table 1), page 9 line 23 to 24 (table 2), page 11 line 36 to 37 (table 3), page 13 line 22 to 23 (table 4), and page 16 line 29 to 31 (table 5).

16-The writing of the results does not provide a deep level of analysis, beyond what is already expressed in the tables and figures.
Thank you for your comment, the writing of the results has been revised to provide a deep level of analysis as shown in page 10 line 33 to 60 and page 12 line 4 to 33.

DISCUSSION

17-The use of the composite coverage index can contribute to support the discussion, as well as the use of complex measures of inequality.
Thank you for your comment, we did not use the composite coverage index in the study due to limited data for most of the indicators. The authors computed an RMNCH index based on the methods reported in the study as shown in page 9 line 34 to 52. Regarding the use of complex measures of inequality, the discussion has been revised to reflect the result of the population attributable risk as shown in page 21 line 41 to 60.

18-Some of the conclusions are based on data that were current at that time and that, probably, if a reanalysis is done with updated information, a change can be observed.
Thank you for your comment, we acknowledge that current data may show substantial improvements and recommend further primary research on the coverage of RMNCH services in Nigeria. These statements can be found in page 22 line 57 to 60, page 23 line 58 to 60, and page 24 line 23 to 29.

19-Study limitations should be better explained within the discussion of the article.
Thank you for your comment, the limitations of the study have been explained within the discussion as shown in page 22 line 57 to 60, page 23 line 11 to 16 and line 49 to 60.

BIBLIOGRAPHY

20-Some references do not have invalid links NO. 6-8-25 and others. Others do not have access to the clear and complete document Ref. No. 5 and others.
Thank you for your comment, the references have been revised as shown in page 26 to 38.

21-References must be appropriate to the style of the journal
Thank you for your comment, the references have been revised as shown in page 26 to 38

Review of bmj-open-2022-061595 “An insight on Nigeria’s progress towards universal coverage of reproductive, maternal, newborn, and child health services: a secondary data analysis.” Overall an important topic. Manuscript is well-written and notes appropriate limitations. The manuscript needs to be thoroughly checked to ensure that when percentage points are being mentioned, they are not labeled as percentages. There is a big difference in percentage increase and percentage point increase. Percentage point increases/decreases are inconsistently labeled – sometimes referred to as just % and sometimes %-point. Make sure ALL are appropriately labeled as %-point. I have noted the places where I saw this below:

Thank you for the comment, we have revised the manuscripts to ensure all % increase or decrease are replaced with %-point

Abstract: All the % increases mentioned should be %-point increases.
Thank you for the comment, all % increases in the abstract have been replaced with %-point as shown in page 2 line 35
Page 6, lines 16 and 18—while perhaps justified, the use of the words “horrific” and “appalling” are emotionally laden and inappropriate in a scientific article.

Thank you for your comments, we have changed the word from “horrific” and “appalling” to “poor” in page 5 line 13 and 15

Page 6, line 27—typo replace “furthered” with “further”

Thank you for the correction, we have replaced “furthered” with “further” in page 5 line 23

Page 14—Table 3—heading for Difference between coverage in latest year and 2015 should indicate % points, not just %. This is done in the text, but not in the table heading. Same for difference between 2018 and 80% heading.

Thank you for the comment, the headings (currently in table 4) have been revised as shown in page 13

Page 16, lines 46-48: again it is percentage points not percent—so 13.3%-point and 26.8%-point.

Thank you for the comment, %-point has been included in page 17 line 7 and 9

Page 18, line 3: 23.2%-point

Thank you for the comment, %-point has been included in page 18 line 20

Page 18, line 27 “recommended by WHO”—add word by to sentence

Thank you for the comment, the sentence has been revised in page 18 line 42

The proof had the figure captions but not the figures—would have been good if reviewers could see the figures.

VERSION 2 – REVIEW

| REVIEWER                      | Colomé-Hidalgo, Manuel  |
|------------------------------|-------------------------|
|                              | Universidad Rey Juan Carlos |
| REVIEW RETURNED              | 03-May-2022             |

| GENERAL COMMENTS | Abstract |
|------------------|---------|
|                  | 1-Should follow the BMJ structure |
|                  | 2-The first sentence is a conclusion. |
|                  | 3- If you write absolute inequality is not necessary to clarify difference (D) |
|                  | 4- Define the acronyms only if they will be used more than once in this section. |
|                  | Methods |
|                  | 5- As the authors respond: “The slope inequality index and the concentration index can only be calculated for dimensions with more than two subgroups”. I appreciate the PAR inclusion, but Table 5 shows several equity dimensions with more than two |
subgroups, please reconsider including the suggested complex equity measures. Please correct it appropriately in the results section.

6- I congratulate the authors for the improvements in this section, however, the writing need to be more precise and clear. Please pay attention to expressions and statements.

Discussion

7- Please provide a detailed description of the study limitations in this section. Some of them are inside the response letter. Authors should include all study limitations in the same paragraph, this will be helpful for readers.

Data statement

8- Follow the examples in published articles.

| REVIEWER                      | Crowell, Nancy                        |
|-------------------------------|---------------------------------------|
| Georgetown University, Nursing and Health Studies |

| REVIEW RETURNED | 09-May-2022 |
|-----------------|-------------|

| GENERAL COMMENTS | Authors have responded adequately to reviewer comments. |
|------------------|--------------------------------------------------------|

**VERSION 2 – AUTHOR RESPONSE**

Reviewer: 1

Dr. Manuel Colomé-Hidalgo, Universidad Rey Juan Carlos, Instituto Tecnologico de Santo Domingo

Comments to the Author:

Abstract

1- Should follow the BMJ structure

Thank you for your comment; the structure of the abstract in the manuscript aligns with BMJ Open’s abstract format at [https://bmjopen.bmj.com/pages/authors/#submission_guidelines](https://bmjopen.bmj.com/pages/authors/#submission_guidelines). Upon submission of the manuscript, the authors revised the abstract based on the editorial office’s request to write the abstract in the current format before it was assigned to the Editor.

2- The first sentence is a conclusion.

Thank you for your comment; the first conclusive sentence, "The coverage of RMNCH services in Nigeria is progressing slowly in a fluctuating pattern," in the result section of the abstract has been deleted. Kindly refer to page 2, line 29.

3- If you write absolute inequality is not necessary to clarify difference (D)
Thank you for your comment, the statement "The widest absolute inequality was by economic status with the difference (D) ranging from 21.9%-point [95% CI: 10.1–33.8] to 56.3%-point [95% CI: 51.5–61.2]" has been revised to "The widest inequality was by economic status with the difference ranging from 21.9%-point [95% CI: 10.1–33.8] to 56.3%-point [95% CI: 51.5–61.2]". Kindly refer to page 2, line 31.

4- Define the acronyms only if they will be used more than once in this section.

The acronyms "DTP3" in this section have been revised as suggested. Kindly refer to page 2, line 40

Methods

5- As the authors respond: "The slope inequality index and the concentration index can only be calculated for dimensions with more than two subgroups”. I appreciate the PAR inclusion, but Table 5 shows several equity dimensions with more than two subgroups, please reconsider including the suggested complex equity measures. Please correct it appropriately in the results section.

Thank you for the suggestion; the slope inequality index and the concentration index have been calculated for the economic and educational status dimension. Kindly refer to page 10, lines 5 to 13, page 13, lines 25 to 29, pages 14 to 19 (Table 5), and page 24, lines 39 to 45.

6- I congratulate the authors for the improvements in this section, however, the writing need to be more precise and clear. Please pay attention to expressions and statements.

Thank you for your comment; this section has been revised as suggested.

Discussion

7- Please provide a detailed description of the study limitations in this section. Some of them are inside the response letter. Authors should include all study limitations in the same paragraph, this will be helpful for readers.

Thank you for your comment; the study's limitations have been included in the same paragraph. Please refer to page 26, lines 39 to 60.

Data statement

8- Follow the examples in published articles.
The data statement has been revised as suggested. Please refer to page 27, lines 56 to 59.

**VERSION 3 – REVIEW**

| REVIEWER          | Colomé-Hidalgo, Manuel  |
|-------------------|-------------------------|
|                   | Universidad Rey Juan Carlos |
| REVIEW RETURNED   | 21-Jun-2022              |
| GENERAL COMMENTS  | None                    |