PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea – Evidence from a Cross-Sectional Survey
AUTHORS	Hou, Xiaohui; Khan, M. Mahmud; Pulford, Justin; Saweri, Olga

VERSION 1 – REVIEW

REVIEWER	Mola, Glen Department of Obstetrics & Gynaecology, University of Papua New Guinea,
REVIEW RETURNED	15-Apr-2021

GENERAL COMMENTS	Obstetrical forceps are not used in PNG, and health workers are not trained to use them. If 'forceps' were found in health facilities they may have been other kinds of forceps. The issue of upskilling of CHWs to perform advanced maternal and newborn care in rural health facilities (level 3 and 4) is not mentioned. These 6 months inservice trainings have now been carried out in 14 provinces and have had a major impact to improve maternal and newborn health. No mention has been made of the 'incentivization of supervised birth" in Milne Bay and Simbu provinces - which has resulted in 100+% increase in supervised births in these areas. Wayessa, Zelalem Bule Hora University, Midwifery 23-Apr-2021 Title: Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea General comments and suggestions • The title is informative and relevant • The manuscript should be prepared as per guidelines of journal guidelines. • Abstract should contain; Background section, Aim, Design and Setting, participants, methods, Results, and conclusions • Introduction; - In the introduction section, authors are rarely addressed what is known and unknown for this significant problem. What are the most common causes of maternal death in PNG? You did mention basic emergency obstetric care and comprehensive emergency obstetric care in the study area. You have to mention it • Methods: you need to reconsider some important elements that were missed -How your variables are measured? In order to measure EmOC readiness, what about staffing, guidelines, training staff,

	equipment, and supplies, laboratory capacity for cross-match testing, and medicine and commodities? You didn't mention some of it. Why? - Under the availability of family planning you only select oral pills, FP injection, and a condom. What about other FP like IUCD and Implanon etc? - How many health care workers available for each facility? Results: - What was your response rate? You have to describe the characteristics of health facilities, Health care workers, and others by using different self-explanatory graphs. - List of tables should come after references. Discussion: - The discussion should be supported by the results found in previous literature. Conclusion: Is based on finding. However, it misses recommendation parts

REVIEWER	Wayessa, Zelalem Bule Hora University, Midwifery
REVIEW RETURNED	23-Apr-2021

GENERAL COMMENTS	Title: Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea General comments and suggestions • The title is informative and relevant • The manuscript should be prepared as per guidelines of journal guidelines. • Abstract should contain; Background section, Aim, Design and Setting, participants, methods, Results, and conclusions • Introduction; - In the introduction section, authors are rarely addressed what is known and unknown for this significant problem. What are the most common causes of maternal death in PNG? You did mention basic emergency obstetric care and comprehensive emergency obstetric care in the study area. You have to mention it • Methods: you need to reconsider some important elements that were missed -How your variables are measured? In order to measure EmOC readiness, what about staffing, guidelines, training staff, equipment, and supplies, laboratory capacity for cross-match testing, and medicine and commodities? You didn't mention some of it. Why? - Under the availability of family planning you only select oral pills, FP injection, and a condom. What about other FP like IUCD and Implanon etc? - How many health care workers available for each facility? Results: - What was your response rate? You have to describe the characteristics of health facilities, Health care workers, and others by using different self-explanatory graphs. - List of tables should come after references. Discussion: - The discussion should be supported by the results found in previous literature. Conclusion: Is based on finding. However, it misses recommendation parts

REVIEWER	Ansari, Nasratullah

	Vrije Universiteit
REVIEW RETURNED	29-Apr-2021

GENERAL COMMENTS	The manuscript describes the readiness of health facilities to provide emergency obstetric care in Papua New Guinea. The study was a cross-sectional health facility survey. The authors concluded that the provision of BEmOC services at level 3 and 4 facilities are inadequate, and it is a matter of concern. Therefore, they recommended upgrading level 3 and 4 facilities to provide at least BEmOC services. Congratulations to the authors and investigators on conducting the study and writing the manuscript. Below are the specific comments. Abstract: The categories of readiness to provide obstetric care services are confusing. It would be better to use the updated term emergency obstetric, and newborn care (EmONC)/or previously used Emergency Obstetric Care (EmOC) term throughout the manuscript. “Availability of family planning items” (category 2) is not part of emergency obstetric and newborn care. The authors need to describe family planning separately from Emergency Obstetric and Newborn Care (EmONC). It is unclear why the authors did not include newborn care as a part of EmONC signal functions. Instead of using maternal and newborn equipment and supply, it will be better to use supply and equipment for EmONC. Conclusion: It is not very clear to use obstetric first aid and EmOC. It would be better to use EmOC that covers the classic term obstetric first aid. The conclusion does not cover family planning. Introduction: Page 6, line 7: It would be better to define both CEmOC and BEmOC based on WHO’s definition. 7 BEmOC and 2 CEmOC signal functions should clearly be defined. Page 6, line 33: “The purpose of this study is to measure health facility readiness to provide obstetric care and the quality of such services provided in PNG…” It would be better to keep “readiness” and remove “quality” because the methods and results show measuring the readiness of health facilities in providing EmONC services and availably of equipment and supplies. Meanwhile, it would be better to use EmOC throughout the manuscript consistently. Methods Page 8, line 6: It is necessary to describe the tools used to collect data, including their title and source, how they were adapted to the context. Page 8, line 8-24: It is good to see a general survey description such as costing and inpatient and outpatient interviews. It will better to mention that these components were excluded from this manuscript. Page 8, line 43-55: Maternal health services term is inconsistent with the EmOC. If this study aims to measure the readiness of health facilities in the provision of EmOC, the authors need to use appropriate terms linked to EmOC. For example, it will be better to revise facility readiness to provide clinical services to facility readiness to provide EmOC services. Also, instead of "availability of maternal and neonatal equipment and materials," it would be better to use the availability of supplies and equipment for EmOC. Availability of family planning (FP) items is not part of EmOC/obstetric care. Therefore, it is strange to see the FP items in the manuscript while the study's objective is EmOC readiness.

	Page 9, line 13-18: The subcategories are ambiguous. Maternal and neonatal care services are broad terms, and ANC is a component of maternal health. It is unclear why the authors shift from EmOC toward maternal health and ANC. Page 9, line 19-35: The definition of signal function is not correct. The authors can consider the below reference to cite the appropriate definition of signal functions. WHO, UNFPA, UNICEF. Averting Maternal Death and Disability Program. Monitoring emergency obstetric care: A handbook. Geneva: WHO; 2009. It would be better to analyze the data based on defined BEmOC or CEmOC signal functions rather than categorize them in obstetric first aid and BEmOC. However, BEmOC signal functions cover the old obstetric first aid term and its components. Moreover, neonatal resuscitation as the 7th BEmOC signal function is missing from the methods. Therefore, it would be better to revise the entire paragraph based on signal functions used to identify basic and comprehensive emergency obstetric care services. Result Page 10 and 11: "Ability to provide emergency obstetric care services." It would be better to present the results based on two categories- BEmOC and CEmOC signal functions. In addition, it will be interesting to see the results for each signal function instead of combing three signal functions such as administer antibiotics, oxytocics, and anticonvulsants. Discussion: In the discussion section, the authors need to discuss the presented results and compare the results with other studies. On page 12, lines 23-35: The paragraph is not relevant to the study's findings. This study is not about health financing. Therefore, it would be better to revise the paragraph that should be more relevant to the findings. Page 11, line 34-42: Discussing family planning are irrelevant to EmOC.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer comment: Obstetrical forceps are not used in PNG, and health workers are not trained to use them. If 'forceps' were found in health facilities they may have been other kinds of forceps.

Response: In the facility survey, respondents from the facilities were asked about the presence of forceps in the facilities when questions were posed on maternal health services. Many facilities reported presence of forceps. Thanks for the information that the forceps are not used in PNG in obstetric care. Even though we have not emphasized forceps availability in the paper, in this revised version a statement has been added to raise the concern that respondents may confuse obstetric care forceps with forceps used for other purposes (see paragraph 3 last sentence in the sub-section "Availability of supplies and equipment for maternity care" on page 12 of the clean copy version).

Reviewer comment: The issue of upskilling of CHWs to perform advanced maternal and newborn care in rural health facilities (level 3 and 4) is not mentioned. These 6 months in-service trainings have now been carried out in 14 provinces and have had a major impact to improve maternal and newborn health.

Response: Thanks for providing the report for out reference. We have mentioned some relevant information from this memo/report in the revised version. Please see paragraph 3, page 14.

Reviewer comment: No mention has been made of the 'incentivization of supervised birth" in Milne Bay and Simbu provinces - which has resulted in 100+% increase in supervised births in these areas.
Response: The incentivization initiate has been discussed in the third paragraph, last sentence of page 14 in the revised version. An essay written by Dr. Mola has also been referred in this section.
Reviewer: 2
Reviewer comment: Title: Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea General comments and suggestions: The title is informative and relevant
Response: We thank the reviewer for comment on the title of the paper. We have slightly modified the title to indicate that the paper examines other related maternity services even though the focus is on emergency obstetric care.
Reviewer comment: The manuscript should be prepared as per guidelines of journal.
Response: We have updated the manuscript following the general guidelines of the journal.
Reviewer comment: Abstract should contain; Background section, Aim, Design and Setting, participants, methods, Results, and conclusions
Response: Thank you very much for suggesting changes in the abstract using BMJ Open guideline. Using the instructions, the abstract has been revised. The abstract now has the following sections: Objectives, Design, Setting, Participants, Primary and secondary outcome measures, Results and Conclusions.
Reviewer comment: Introduction; - In the introduction section, authors are rarely addressed what is known and unknown for this significant problem. What are the most common causes of maternal death in PNG? You did mention basic emergency obstetric care and comprehensive emergency obstetric care in the study area. You have to mention it.
Response: In the introduction section, we have clarified that almost no information is available at the national level about the availability of obstetric care services in PNG. We emphasized that this is the first facility survey in PNG that measured readiness of health facilities in the provision of obstetric care and other inpatient clinical services. A study on causes of maternal deaths has been used to provide a list of common causes of death.
Reviewer comment: Methods: you need to reconsider some important elements that were missed -- How your variables are measured? In order to measure EmOC readiness, what about staffing, guidelines, training staff, equipment, and supplies, laboratory capacity for cross-match testing, and medicine and commodities? You didn't mention some of it. Why?
Response: The method of calculating the indexes are clarified in the text. Using WHO recommended approach of monitoring improvements in EmOC services, signal functions were used. Ability to perform signal functions is assumed to indicate presence of relevant personnel and other related supplies. All nine signal functions of EmOC has now been explicitly considered in the paper. Relevant equipment, supplies and drugs have been considered as well in the analysis when examining the ability to perform the signal functions.
Reviewer comment: Under the availability of family planning you only select oral pills, FP injection, and a condom. What about other FP like IUCD and Implanon etc.?
Response: Unfortunately, the facility survey did not collect information on any other supplies other than oral pills, condoms and FP injections. Because of lack of data, other FP methods could not be included. The purpose of examining availability of common FP supplies is to better understand the access of women to family planning services and the common FP supplies should be able to indicate the degree of availability/ access FP services in the country.
Reviewer comment: How many health care workers available for each facility?
Response: The survey has collected detailed information on personnel/health workers in each of the facilities surveyed. A discussion of health worker availability by cadre, their presence in the facility, etc. is beyond the scope of the paper. To evaluate the availability of EmOC, number of health care workers in the facilities is important but the ability to perform the signal functions is considered to indicate the availability of right mix of personnel. Note that the WHO handbook on monitoring emergency obstetric care did not include personnel availability to understand the ability of facilities to

provide EmOC. In our paper, however, one metric in the index of readiness is the availability of skilled birth attendance (see table 3).
Reviewer comment on results section: (i) What was your response rate? You have to describe the characteristics of health facilities, Health care workers, and others by using different self-explanatory graphs.
Response: The method section has explained the number of facilities selected for survey and actual number of facilities surveyed. All 19 facilities at levels 5 to 7 were selected for the survey and all facilities participated, although one facility was not fully functional at the time of the survey. The plan was to collect data from 60 level 3-4 facilities but the survey actually collected data from 54 facilities. The reason for lower than planned number of facilities surveyed was not due to non-response but due to presence of non-functioning facilities in the list of facilities in PNG.
Reviewer comment: List of tables should come after references.
Response: The manuscript has been revised as suggested.
Reviewer comment on Discussion section: The discussion should be supported by the results found in previous literature. Conclusion: Is based on finding. However, it misses recommendation parts.
Response: There are no other study that examined readiness and availability of maternity and neonatal health services in PNG at the national level. In the discussion, few relevant previous literature has been mentioned.
Reviewer: 3
Reviewer comments: The manuscript describes the readiness of health facilities to provide emergency obstetric care in Papua New Guinea. The study was a cross-sectional health facility survey. The authors concluded that the provision of BEmOC services at level 3 and 4 facilities are inadequate, and it is a matter of concern. Therefore, they recommended upgrading level 3 and 4 facilities to provide at least BEmOC services.
Congratulations to the authors and investigators on conducting the study and writing the manuscript.
Response: Thank you very much for your positive comment.
Reviewer comments: Abstract: The categories of readiness to provide obstetric care services are confusing. It would be better to use the updated term emergency obstetric, and newborn care (EmONC)/or previously used Emergency Obstetric Care (EmOC) term throughout the manuscript. "Availability of family planning items" (category 2) is not part of emergency obstetric and newborn care. The authors need to describe family planning separately from Emergency Obstetric and Newborn Care (EmONC). It is unclear why the authors did not include newborn care as a part of EmONC signal functions. Instead of using maternal and newborn equipment and supply, it will be better to use supply and equipment for EmONC.
Response: We have used the term EmOC throughout the paper. As mentioned above, availability and access to family planning items have been used to understand potential for significant reduction in total fertility rate. Reduction in total fertility rate will lower the demand for maternity services. Based on the recommendation, newborn care related signal function has now been included in the evaluation of obstetric care. Rather than using "maternal and newborn equipment and supply", we have used the term "supplies and equipment for maternity care" and within this category, two sub-categories are defined: antenatal and pregnancy related items and obstetric and neonatal care items.
Reviewer comment: Conclusion section: It is not very clear to use obstetric first aid and EmOC. It would be better to use EmOC that covers the classic term obstetric first aid. The conclusion does not cover family planning.
Response: We have deleted any reference to the term "obstetric first aid". In the revised version, we have used EmOC throughout the paper. Conclusion briefly mentions the importance of family planning services in an effort for improving maternal and neonatal health.
Reviewer comment: Introduction: Page 6, line 7: It would be better to define both CEmOC and BEmOC based on WHO's definition. 7 BEmOC and 2 CEmOC signal functions should clearly be defined.
Response: We have defined CEmOC and BEmOC using WHO definition and used all the nine signal functions for monitoring EmOC.

Reviewer comment: Page 6, line 33: “The purpose of this study is to measure health facility readiness to provide obstetric care and the quality of such services provided in PNG…” It would be better to keep “readiness” and remove “quality” because the methods and results show measuring the readiness of health facilities in providing EmONC services and availably of equipment and supplies. Meanwhile, it would be better to use EmOC throughout the manuscript consistently.
Response: In general, reference to quality has been removed. Some of the structural and process indicators, in addition to showing readiness also indicate level of quality. In the context of the conceptual framework used for the analysis, the term “quality” has been mentioned to emphasize that the framework was developed to understand health care quality even though it focuses on a number of structural, process and outcome variables.
Reviewer comment: Methods: Page 8, line 6: It is necessary to describe the tools used to collect data, including their title and source, how they were adapted to the context. Page 8, line 8-24: It is good to see a general survey description such as costing and inpatient and outpatient interviews. It will better to mention that these components were excluded from this manuscript. Page 8, line 43-55: Maternal health services term is inconsistent with the EmOC. If this study aims to measure the readiness of health facilities in the provision of EmOC, the authors need to use appropriate terms linked to EmOC. For example, it will be better to revise facility readiness to provide clinical services to facility readiness to provide EmOC services. Also, instead of "availability of maternal and neonatal equipment and materials," it would be better to use the availability of supplies and equipment for EmOC.
Response: Due to space limitations, we have referred the main report of the survey to get additional information on each of the tools used for data collection purposes. We have mentioned in the method section that only the facility assessment questionnaire was used in this analysis. Thanks for suggesting the alternative term to use. We have now used the term “availability of supplies and equipment for maternity care”. Since the term “maternity care” is quite general which incorporates all types of care related to pregnancy, childbirth and post-natal care, we have used this term because the range of items and equipment considered in evaluating readiness of facilities is wider than the obstetric care needs alone.
Reviewer comment: Availability of family planning (FP) items is not part of EmOC/obstetric care. Therefore, it is strange to see the FP items in the manuscript while the study's objective is EmOC readiness.
Response: FP is not part of EmOC but, as we have explained in the revised version, FP does affect demand as well as degree of access to EmOC. Reduction in total fertility rate through FP reduces the demand for maternity care on the one hand and on the other hand, given the supply of EmOC providers in the country, lower demand for EmOC improves access to care.
Reviewer comment: Page 9, line 13-18: The subcategories are ambiguous. Maternal and neonatal care services are broad terms, and ANC is a component of maternal health. It is unclear why the authors shift from EmOC toward maternal health and ANC.
Response: Based on the suggestion (mentioned above), we have used the term “availability of supplies and equipment for maternity care”. The supplies and instruments used for the provision of maternity care have been subdivided into two broad categories: “antenatal and pregnancy-related items” and “obstetric and neonatal care items”.
Reviewer comment: Page 9, line 19-35: The definition of signal function is not correct. The authors can consider the below reference to cite the appropriate definition of signal functions. WHO, UNFPA, UNICEF. Averting Maternal Death and Disability Program. Monitoring emergency obstetric care: A handbook. Geneva: WHO; 2009.
Response: We have now used all the signal functions mentioned in the handbook. All nine signal functions have been used in the analysis as shown in table 4.
Reviewer comment: It would be better to analyze the data based on defined BEmOC or CEmOC signal functions rather than categorize them in obstetric first aid and BEmOC. However, BEmOC signal functions cover the old obstetric first aid term and its components. Moreover, neonatal resuscitation as the 7th BEmOC signal function is missing from the methods. Therefore, it would be

better to revise the entire paragraph based on signal functions used to identify basic and comprehensive emergency obstetric care services.
Response: We have excluded the terms “obstetric first aid” and defined BEmOC and CEmOC based on the definitions provided in the WHO handbook. Neonatal resuscitation has been incorporated, as suggested. The survey collected this information as well and thanks for pointing out that this represents one of the signal functions for BEmOC.
Reviewer comment: Result: Page 10 and 11: “Ability to provide emergency obstetric care services.” It would be better to present the results based on two categories- BEmOC and CEmOC signal functions. In addition, it will be interesting to see the results for each signal function instead of combing three signal functions such as administer antibiotics, oxytocics, and anticonvulsants.
Response: We have revised table 4 to show these two categories, BEmOC and CEmOC. In the survey, the first three signal functions was combined into one question and the respondents were asked to report whether the facility can perform all three functions, two of the three functions, one of the three functions and none of the three functions. Table 4 has been updated by incorporating this additional information on signal functions 1-3.
Reviewer comment: Discussion: In the discussion section, the authors need to discuss the presented results and compare the results with other studies. On page 12, lines 23-35: The paragraph is not relevant to the study's findings. This study is not about health financing. Therefore, it would be better to revise the paragraph that should be more relevant to the findings.
Response: There are only a limited number of studies available for PNG on the readiness of facilities to provide inpatient services and maternity care. We have mentioned the articles that are available. This is the first study examining the readiness of facilities in the provision of maternity care at the national level in PNG. We have also revised the health financing section to focus on the resource needs to upgrade facilities to increase the number of EmOC providers as well as demand-side incentives to increase institutional delivery.
Reviewer comment: Page 11, line 34-42: Discussing family planning are irrelevant to EmOC.
Response: Family planning (FP) has been discussed as a means for lowering the need for EmOC services and to improve access to obstetric care. FP acts almost like a preventive intervention for lowering maternal and neonatal mortality and morbidity. The paper has now clarified the context of discussing FP in the analysis of readiness and availability of EmOC.

VERSION 2 – REVIEW

REVIEWER	Mola, Glen Department of Obstetrics & Gynaecology, University of Papua New Guinea,
REVIEW RETURNED	11-Sep-2021

GENERAL COMMENTS	Authors should note that in PNG the BEmOC signal function for assisted vaginal delivery is carried out by vacuum extraction (and not obstetrical forceps); It is a pity that the study did not survey for the availability of vacuum extraction equipment and use in the various level facilities

REVIEWER	Ansari, Nasratullah Vrije Universiteit
REVIEW RETURNED	23-Sep-2021

GENERAL COMMENTS	The authors have addressed most of the comments in the new version of the manuscript.

	Below are the specific comments and suggestions for further improvement of the manuscript. Title: "other related services" seems vague. It would be better to remove it and add the study's design as: "a cross-sectional study." Abstract: Page 4, line 13: "level 3 and 4 health facilities" are ambiguous here. The authors may consider naming the type of health facilities or shortly define these levels. Page 4: Link 23: The number of participants (interviewees) and specifications are missing. It is incredibly challenging to claim, "Strengthening family planning services will also help improve access to EmOC." It will be better to revise the statement. Introduction:The objective of the study needs to be specific. "Other related services" is ambiguous. It will be better to make the objective of the study more specific. Methods: Page 10, lines 32-34: This statement seems controversial: "Another important intervention that improves access to obstetric care is through effective provision of family planning services, which reduce the demand for EmOC." Effective FP services may reduce the demand for EmONC but not necessarily improve access to obstetric care/or EmONC. It is crucial to elaborate on how the informed consent was obtained and how data confidentiality and privacy were maintained. The authors need to consider indicating number or # in the column heading of the tables. Results: Page 11: It will be interesting to read the critical results of readiness assessment such as operation theatre, blood translation (Facility does direct blood transfusion) in the text. The authors need to consider the consistency of pregnancy care, antenatal care (ANC), neonatal and postnatal care in the tables and the text (page 13, line 6). In table 3, it is confusing to see both pregnancy care and ANC at the bottom of the table. Maybe the authors can divide table 3 into two sections, such as ANC items and obstetric and neonatal care items, and at the end of each section, they can include the index values. This way, it will be easier for the readers to identify and differentiate the ANC from obstetric and neonatal items. Page 12, line 11: Postnatal care is not reflected in the table. It is indicated as neonatal care. Consistency of the terms is required. Page 12, line 14: It is considered as the interpretation of the data. It needs to be discussed in the discussion section, not necessarily in the results section. Page 12, lines 21-36: It is strange to see three different signal functions combined. The readers will be interested to see the performance of each signal function separately. Unfortunately, it is a missed opportunity. Discussion Page 13, line 18: It is possible that the access to FP services in a community can be low, and the availability of FP services in health facilities can be high. Interestingly, this study showed that the availability of FP services in health facilities was high in levels 3, 4, 5, and 6, but the authors argued as low availability and compared

	it with DHS findings, which demonstrated the access and utilization rate of the FP services. Generally, this argument seems confusing, and it can be revised based on the findings of the study. The author may argue why contraceptive injection is not available in level 7? Page 13, lines 39-56: There is new information in the discussion section - geographical access to CEmONC, and it is not reflected in the results. It is strange to argue the new findings in the discussion section. It will be better to link the paragraph to the findings and objective of the study or remove it. Conclusion: The importance of family planning is well described; however, the findings of this study show little gaps in the availability of family planning services. The authors need to consider concluding the manuscript based on the findings.

VERSION 2 – AUTHOR RESPONSE

Reviewer 1	Authors should note that in PNG the BEmOC signal function for assisted vaginal delivery is carried out by vacuum extraction (and not obstetrical forceps); It is a pity that the study did not survey for the availability of vacuum extraction equipment and use in the various level facilities	Please see page 12, line 26 to 34, of the clean copy of the manuscript. This section clarifies the information collected. The survey did collect data on availability of vacuum extractors but in assisted delivery question, the questionnaire did not specifically ask if the delivery was done with forcep or vacuum extractor. The last few sentences of the section now reads: The survey also asked about the availability of vacuum extractors and forceps in the facilities for conducting deliveries. It is interesting that 74% of facilities reported having vacuum extractors and 95% reported having forceps although forceps are not used in PNG for deliveries.
Reviewer 3	Title, abstract and introduction section	
	Title: "other related services" seems vague. It would be better to remove it and add the study's design as: "a cross-sectional study."	Title has been revised as suggested.
	Page 4, line 13: "level 3 and 4 health facilities" are ambiguous here. The authors may consider naming the type of health facilities or shortly define these levels.	Addressed. Rather than using facility level numbers, facility type names are used.
	Page 4: Link 23: The number of participants (interviewees) and specifications are missing. It is incredibly challenging to claim, "Strengthening family planning services will also help improve access to EmOC." It will be better to revise the statement.	We have revised the section. Number of interviewers are mentioned and the sentence on the role of family planning on demand for EmOC has been removed from the abstract.
	Introduction: The objective of the study needs to be specific. "Other related services" is ambiguous. It will be better to make the objective of the study more specific.	The objective of the study has been made more specific and the term “other related services” has been specified in the revised version of the introduction. Please see lines 17-22 of page 7 in the clean version of the document.

Methods		
	Page 10, lines 32-34: This statement seems controversial: "Another important intervention that improves access to obstetric care is through effective provision of family planning services, which reduce the demand for EmOC." Effective FP services may reduce the demand for EmONC but not necessarily improve access to obstetric care/or EmONC.	This point has been clarified in the method section. Please see line 37 page 10 and lines 1 and 2 of page 11. The idea is that if the availability and supply of EmONC services remain the same, effective family planning in a high total fertility country will reduce demand in the medium-run and therefore, may improve access.
	It is crucial to elaborate on how the informed consent was obtained and how data confidentiality and privacy were maintained.	We have introduced a section on informed consent in the method section of the paper. Please see the section “Informed consents for the survey”, page 9 and 10 in the clean copy version of the paper.
	The authors need to consider indicating number or # in the column heading of the tables.	Updated. Tables now indicate the sample size of facilities by facility-type or levels.
Results		
	Page 11: It will be interesting to read the critical results of readiness assessment such as operation theatre, blood translation (Facility does direct blood transfusion) in the text. Page 12, line 11: Postnatal care is not reflected in the table. It is indicated as neonatal care. Consistency of the terms is required.	Revised the results section to summarize the results on readiness. See lines 9-13, page 12. The terms have been made consistent. We have revised the text (line 30-31, page 12) to indicate that the results are related to neonatal care.
	The authors need to consider the consistency of pregnancy care, antenatal care (ANC), neonatal and postnatal care in the tables and the text (page 13, line 6). In table 3, it is confusing to see both pregnancy care and ANC at the bottom of the table. Maybe the authors can divide table 3 into two sections, such as ANC items and obstetric and neonatal care items, and at the end of each section, they can include the index values. This way, it will be easier for the readers to identify and differentiate the ANC from obstetric and neonatal items.	Thanks for the suggestion. This will improve the presentation of the information. Based on the suggestion, the table has been revised. Now, the table has two sections, the first part lists ANC related items with obstetric and neonatal items listed in the second part.
	Page 12, line 11: Postnatal care is not reflected in the table. It is indicated as neonatal care. Consistency of the terms is required.	Revised
	Page 12, line 14: It is considered as the interpretation of the data. It needs to be discussed in the discussion section, not necessarily in the results section.	This only summarized the results, not interpreting the results. It has been slightly modified.
	Page 12, lines 21-36: It is strange to see three different signal functions combined. The readers will be interested to see the performance of each signal function separately. Unfortunately, it is a missed opportunity.	These three are very basic emergency obstetric care functions and the question asked if the facility is able to do any one of the functions, two of the three functions, all the three functions and none of the three functions. It did not ask about each of the functions separately. Since we are interested in identifying the facilities that can perform all three of these basic functions, the results will be the same even when the questions are asked separately. Asking questions separately would have provided information on the limiting factors in the provision of these basic obstetric functions.
Discussion section		

	Page 13, line 18: It is possible that the access to FP services in a community can be low, and the availability of FP services in health facilities can be high. Interestingly, this study showed that the availability of FP services in health facilities was high in levels 3, 4, 5, and 6, but the authors argued as low availability and compared it with DHS findings, which demonstrated the access and utilization rate of the FP services. Generally, this argument seems confusing, and it can be revised based on the findings of the study. The author may argue why contraceptive injection is not available in level 7?	Availability of these relatively low-cost family planning services should be available at all levels. Even at levels 3-4 facilities, 83% index of availability should be viewed as a problem as 100% of the facilities should have the family planning items. The DHS found that actual utilization is significantly lower than the availability index will imply. We wanted point out that availability at health facilities does not necessarily imply that healthcare providers encourage utilization of FP service and supplies and it may also indicate irregular availability of supplies. Effective FP services require uninterrupted supply of items.
	Page 13, lines 39-56: There is new information in the discussion section - geographical access to CEmONC, and it is not reflected in the results. It is strange to argue the new findings in the discussion section. It will be better to link the paragraph to the findings and objective of the study or remove it.	This is an interpretation or potential policy implication of the results. Using the proportion of facilities ready to offer comprehensive obstetric care services, a simple calculation is made to find the number of levels 3-7 facilities that would be comprehensive EmOC providers in the country considering total number of facilities at levels 3 and 4 (as the survey included all levels 5 to 7 facilities). This clearly demonstrates how significant is the access issue for emergency obstetric cases. We have clarified that this is an implication of the results of the study.
Conclusions		
	The importance of family planning is well described; however, the findings of this study show little gaps in the availability of family planning services. The authors need to consider concluding the manuscript based on the findings	We consider the availability index of 83% at levels 3 and 4 facilities as problematic. Even though the index appears high, for basic family planning supplies, it indicates lack of uninterrupted availability. Lack of FP supplies at levels 3-4 of facilities imply that reducing total fertility rate will be difficult for PNG unless FP supply issues are addressed.

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract: TITLE HAS BEEN CHANGED TO INDICATE STUDY DESIGN AS WELL
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found ABSTRACT INCLUDES SUMMARY OF METHOD, EMPIRICAL DESIGN AND RESULTS
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported: IN THE INTRODUCTION SECTION, PARAGRAPHS 2, 3, 4, 5 AND 6 DISCUSSES BACKGROUND AND RATIONALE (PAGES 6 AND 7 OF THE CLEAN COPY)
Objectives	3	State specific objectives, including any prespecified hypotheses: LINES 17 TO 22, PAGE 7 (PARAGRAPH 7 OF INTRODUCTION) STATES THE OBJECTIVE OF THE STUDY.
Methods		
Study design	4	Present key elements of study design early in the paper: ALL ELEMENTS ARE MENTIONED IN METHODS SECTION (PAGES 7-11)
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection SETTING: PAGE 8, LINES 12-34 LOCATIONS: FIRST PAGARPAH OF PAGE 9 DATE OF SURVEY AND DATA COLLECTION: PAGE 8, LINE 36
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants LINES 36 AND 37 OF PAGE 8 AND LINES 6-17 OF PAGE 9
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable SECTION ON "OUTCOME MEASURES", PAGES 10-11.
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group SEE "OUTCOME MEASURES" AND "Calculating readiness or availability index" SECTIONS FOR THE DESCRIPTION OF THE VARIABLES CONSTRUCTED AND ANALYZED (PAGES 10-11)
Bias	9	Describe any efforts to address potential sources of bias SURVEY DESIGN MENTIONS THAT THE SURVEY INCLUDED ALL UPPER LEVEL FACILITIES AND FUNCTIONAL LEVELS 3-4 FACILITIES. THE ISSUE OF ONE POTENTIAL BIAS AND TO ADDRESS IT HAS BEEN MENTIONED IN LINE NUMBER 32-34, PAGE 10.

Study size	10	Explain how the study size was arrived at DISCUSSED IN SURVEY DESIGN SECTION, PAGES 8-9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why PAGES 10-11 DESCRIBES THE DERIVATION OF QUANTITATIVE OUTCOME VARIABLES. AS INDICATED, FACILITY LEVELS WERE USED AS THE GROUPING VARIABLE.
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding THIS STUDY IS A COMPARATIVE ANALYSIS OF READINESS OF HEALTH FACILITIES AND TABLES WERE CONSTRUCTED TO SHOW PERCENT OF FACILITIES ABLE TO PROVIDE SPECIFIC SERVICES. NO ADDITIONAL STATISTICAL ANALYSES WERE CARRIED OUT. THE METHOD OF COMPARISON HAS BEEN PRESENTED ON PAGES 10-11.
		(*b*) Describe any methods used to examine subgroups and interactions. COMPARISON ACROSS HEALTH FACILITY TYPES ARE PRESENTED IN TWO-WAY TABLES AS DESCRIBED
		(*c*) Explain how missing data were addressed. NOT APPLICABLE
		(*d*) If applicable, describe analytical methods taking account of sampling strategy. NOT APPLICABLE
		(*e*) Describe any sensitivity analyses. NOT APPLICABLE
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed NUMBER OF FACILTIIES IN EACH GROUP HAS BEEN MENTIONED IN THE PRESENTATION OF RESULTS AND IN THE TABLES
		(b) Give reasons for non-participation at each stage: NO PARTICIPATION ISSUE. THE FACILITIES VISITED WERE SURVEYED.
		(c) Consider use of a flow diagram: NOT RELEVANT FOR THIS STUDY
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders
		(b) Indicate number of participants with missing data for each variable of interest: FACILITY LEVEL DATA ON MATERNAL HEALTH RELATED INSTRUMENTS, SUPPLIES AND FUNCTIONS WERE AVAILABLE. SOME MISSING INFORMATION WAS PATIENT AND HEALTH CARE PROVIDER RELATED AND THOSE VARIABLES WERE NOT RELEVANT FOR THIS STUDY.

Outcome data	15*	Report numbers of outcome events or summary measures: TABLES PREPARED FOR THE STUDY REPORT ALL THE NUMBERS AND SUMMARY MEASURES
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included AVERAGES ARE USED FOR COMPARATIVE PURPOSES. CONFIDENCE INTERVAL WAS NOT USED AS THE VARIABLES REFER TO AVAILABILITY OF VARIOUS SERVICES, INSTRUMENTS AND FUNCTIONS.
		(*b*) Report category boundaries when continuous variables were categorized. NOT RELEVANT
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period. NOT RELEVANT
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses. NOT RELEVANT
Discussion		
Key results	18	Summarise key results with reference to study objectives. LAST PARAGRAPH OF PAGE 13 AND FIRST TWO PARAGRAPHS OF PAGE 14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias SEE STUDY LIMITATIONS SECTION, PAGE 15.
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence CONCLUSIONS SECTION, PAGE 16
Generalisability	21	Discuss the generalisability (external validity) of the study results GENERALIZABILITY HAS BEEN DISCUSSED IN THE FIRST TWO PARAGRAPHS OF DISCUSSION SECTION.
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based FUNDING SOURCE MENTIONED ON PAGE 3

VERSION 3 – REVIEW

REVIEWER	Ansari, Nasratullah Vrije Universiteit
REVIEW RETURNED	03-Jan-2022

GENERAL COMMENTS	The authors have addressed most of the comments in the latest version of the manuscript. Below are some suggestions for further improvement of the manuscript. Methods: It will be better to describe and provide a reference (s) to the tools adapted to measure the availability of basic medical equipment and supplies and the physical condition of the health facilities. Results: Page 12, line 36-37, and page 13, line 7-8: These sentences are repetitive and necessary. Keeping the consistency of percentage and number as XX % (YY) or YY (XX%) in the results section is necessary. For example, Page 13 line 15, and page 13 lines 4-16. Thank you and best wishes.

VERSION 3 – AUTHOR RESPONSE

Response to review comments: Readiness of Health Facilities, PNG
Reviewer comment: The authors have addressed most of the comments in the latest version of the manuscript.
Response: Thank you very much for all your very helpful comments and suggestions. Your comments made the manuscript much better.
Reviewer comment: Below are some suggestions for further improvement of the manuscript.
Methods: It will be better to describe and provide a reference (s) to the tools adapted to measure the availability of basic medical equipment and supplies and the physical condition of the health facilities.
Response: The standard World Bank facility survey instruments were adapted to PNG situation using the National Health Services Standard document, which indicates the service-mix and instruments/supply needs at different levels. In the method section, we have indicated on page 9 that the document was used to adapt the instruments.
Reviewer comment: Results: Page 12, line 36-37, and page 13, line 7-8: These sentences are repetitive and necessary.
Response: Removed the sentence in lines 7-8 on page 13.
Reviewer comment: Keeping the consistency of percentage and number as XX % (YY) or YY (XX%) in the results section is necessary. For example, Page 13 line 15, and page 13 lines 4-16.
Response: Changes were made throughout the manuscript to keep consistency of percentage and numbers. In the description, percentages are mentioned with the numbers within the parentheses wherever relevant. Track changes show all the edits made on pages 11-13.