

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Assessing the accuracy of health facility typology in representing the availability of health services: a case study in Mali
AUTHORS	Petragallo, Samuel; Timoner, Pablo; Hierink, Fleur; Fuhrer, Caroline; Toure, Ousmane; Iknane, Akory; Coulibaly, Youssouf; FALL, Ibrahima-Soce; Ray, Nicolas

VERSION 1 – REVIEW

REVIEWER	Kerr, Peter Monash Medical Centre, Nephrology
REVIEW RETURNED	03-Jul-2023

GENERAL COMMENTS	<p>Thankyou for this interesting paper. Some of the message is somewhat intuitive - not all health facilities (even in the same strata - such as RHC) are the same. The paper is reasonably well written (a few minor typos) and the message is clear. The MCA figure might need some better explanation so that readers such as I can understand it better.</p> <p>Given the facility care-provision variation, I wonder whether it's worth mentioning in the discussion that analyses and decisions around healthcare provision thus needs to be more specific to the problem - ie. if the perceived problem is paediatric care, then specific provision of paediatric care needs to be assessed and analysed (and so on for other "problems"). My reading of the message is that facility variation is so great that assumptions at facility-type level will be erroneous.</p>
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REVIEWER	Kesale, Anosisye Mzumbe University, Local Government Management
REVIEW RETURNED	28-Aug-2023

GENERAL COMMENTS	<p>I have read the manuscript in a very detailed manner, I must state that the manuscript is very interesting and the flow of the story invite a reader to read every sentence.</p> <p>what I have observed to be small weakness of the manuscript is on the introductory part I have no seen the critics of other empirical studies regarding categorization of the health facility and the availability of service delivery. i think this can be added Also other countries have specified essential health services packages to per facility type, was this considered for this study or have it similar connotations?</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Peter Kerr, Monash Medical Centre

We thank the reviewer for their diligent review of our manuscript and for providing valuable suggestions and comments. We have taken their feedback into consideration and made appropriate revisions throughout the text. In the responses below, we will indicate the specific changes implemented.

Comments to the Author:

Thank you for this interesting paper.

1. Some of the message is somewhat intuitive - not all health facilities (even in the same strata - such as RHC) are the same.

We agree with the reviewer's observation that the conclusion we have drawn may be a familiar concept within the field. However, we have not encountered any existing scientific literature that delves as deeply into exploring this association as our study does. We believe it is crucial to statistically demonstrate the existence of this relationship by utilizing data that encompasses both facility-level and service-level information. To the best of our knowledge, no comparable study of such extensive scope has been conducted. Our findings underscore the significance of not only evaluating the population's access to healthcare facilities but also collecting data at the service level, allowing for a more precise differentiation in our assessments.

2. The paper is reasonably well written (a few minor typos) and the message is clear.

Thank you very much for feedback, we have carefully checked the paper on grammar mistakes and typos, which are indicated in our revised version. We hope the changes sufficiently address the typos observed by the reviewer.

3. The MCA figure might need some better explanation so that readers such as I can understand it better.

We thank the reviewer for the feedback and agree that the description was too technical. We have adapted the figure legend description to the following:

Figure 1. Multiple Correspondence Analysis (MCA) biplots of health facilities based on service availability. The figure shows the relationships between health facilities based on service availability. The points in this two-dimensional graph represent the health facilities. Closer points indicate more similarities in terms of service availability. Different types of health facilities are represented by different colors. The colored ellipses surrounding the points assume multivariate t-distributions. Each ellipse represents a different type of health facility, providing a visual representation of where most facilities of that type fall on the plot, thus capturing the multivariate dispersion of that group. The two axes of the graph depict the dimensions that account for the most variance in the data, with their labels indicating the proportion of the total variance explained by that axis. This means they represent the main patterns of differences in service availability between the health facilities.

4. Given the facility care-provision variation, I wonder whether it's worth mentioning in the discussion that analyses and decisions around healthcare provision thus needs to be more specific to the problem - ie. if the perceived problem is paediatric care, then specific provision of paediatric care needs to be assessed and analysed (and so on for other "problems"). My reading of the message is that facility variation is so great that assumptions at facility-type level will be erroneous.

Yes, we fully agree with the reviewers' line of thought and see that this message may not have come across as clearly as initially thought. We have added the following sentence to the discussion in line 160-164: "This indicates that when conducting research and making policy decisions, relying on assumptions about the delivery of specific services across certain health facility types, like emergency obstetric care in all hospitals, can lead to incorrect conclusions. Instead, it is more appropriate to consider the actual availability of the service at the facility level, rather than relying solely on the type of facility."

Reviewer: 2

Dr. Anosisye Kesale, Mzumbe University

Comments to the Author:

I have read the manuscript in a very detailed manner, I must state that the manuscript is very interesting, and the flow of the story invite a reader to read every sentence.

We thank the reviewer for the thorough and positive feedback on our manuscript. We have carefully considered all of the reviewer's comments and have made changes throughout the manuscript, which we address point by point below. We hope that the revisions are to the reviewer's satisfaction.

1. What I have observed to be small weakness of the manuscript is on the introductory part I have no seen the critics of other empirical studies regarding categorization of the health facility and the availability of service delivery. I think this can be added.

Regrettably, there exists a limited number of studies that investigate the extent to which health facility typology accurately reflects the availability of health services. The studies we are familiar with have been referenced in the introduction, but despite our efforts, we have been unable to find any additional publications to include. Below, we have included the paragraph referencing the most significant studies known to us. If the reviewer is aware of any additional relevant material that we may have missed, we would greatly appreciate sharing it with us.

The most important ones have been mentioned in this passage in line 18-23:

"However, little is known about the relationship between facility type and the effective availability of essential health services at the health facility level[3], as health facility datasets typically do not include information on the type of services effectively provided by a facility[7,10]. Relatively few studies have examined the influence of facility type on the availability of specific health services[11,12] but to our knowledge no analysis of multiple essential services has yet measured the extent of this relationship more broadly.s"

3. South A, Dicko A, Herringer M, et al. A reproducible picture of open access health facility data in Africa and R tools to support improvement [version 2; peer review: 3 approved, 1 approved with reservations]. Wellcome Open Research 2021;5. doi:10.12688/wellcomeopenres.16075.2

7. Weiss D, Nelson A, Vargas-Ruiz C, et al. Global maps of travel time to healthcare facilities. Nature Medicine 2020;26:1835–8.

10. Maina J, Ouma PO, Macharia PM, et al. A spatial database of health facilities managed by the public health sector in sub Saharan Africa. Scientific data 2019;6:1–8.

11. Kim ET, Singh K, Speizer IS, et al. Influences of health facility type for delivery and experience of cesarean section on maternal and newborn postnatal care between birth and facility discharge in Malawi. BMC Health Services Research 2020;20:139. doi:10.1186/s12913-020-4958-4

12. Seiglie JA, Serván-Mori E, Begum T, et al. Predictors of health facility readiness for diabetes service delivery in low- and middle-income countries: The case of Bangladesh. Diabetes Research and Clinical Practice 2020;169. doi:10.1016/j.diabres.2020.108417

2. Also other countries have specified essential health services packages to per facility type, was this considered for this study or have it similar connotations?

The reviewer has made an important point that we would like to explore in future research. In some countries, specific service packages have been defined for different types of facilities, such as in Afghanistan, Yemen, and other nations. However, in the context of Mali, detailed predefined service packages do not currently exist, which limits their exploration within the scope of this study. Nevertheless, we are eager to investigate this further in future studies.

VERSION 2 – REVIEW

REVIEWER	Kerr, Peter Monash Medical Centre, Nephrology
REVIEW RETURNED	22-Nov-2023
GENERAL COMMENTS	Thank you for your changes. Unfortunately, I still have a question around Fig 1 and the legend for this. You have written: "The two axes of the graph depict the dimensions that account for the most variance in the data, with their labels indicating the proportion of the total variance explained

	<p>by that axis. This means they represent the main patterns of differences in service availability between the health facilities." My issue is that the casual observer, just looking at the figure, cannot interpret this as there is no indication of what the axes represent - so, there is no way of interpreting what those patterns of differences in service delivery are.</p> <p>Is this the way the data is intended (or needs) to be displayed or should we be able to drill down a little further?</p>
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VERSION 2 – AUTHOR RESPONSE

Thank you for your message and the opportunity to address the reviewer's comments.

We acknowledge the potential confusion surrounding the figure in question. The multivariate analysis we employed utilizes an eigenvector-based method with the primary goal of dimensionality reduction. This process involves recursively identifying new axes (resembling imaginary variables) that maximize variance among our observations while remaining orthogonal (uncorrelated) to previously determined axes.

In line with standard practices for eigenvector-based methods, the biplot conventionally presents the first axis horizontally and the second one vertically, indicating the respective percentage of explained variance. It's important to note that these new axes do not directly represent specific variables but serve to capture and illustrate variance within the data.

We hope that this clarification sheds light on the rationale behind our presentation, aligning with established practices for eigenvector-based methods.

Thank you for your understanding.