Author’s response to reviews

Title: Quality of care for children with severe disease in Congo, DRC

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Author’s response to reviews:

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Dear Dr. Dawson,

Thank you for your review of our manuscript and for sharing the reviewers’ helpful suggestions for improving it. We have revised the manuscript based on the reviewers’ feedback, and responded point-by-point to their comments below.

We very much appreciate the time you have taken to review our work, and the opportunity to re-submit this manuscript to your journal.

Sincerely,

Günther Fink, on behalf of the study authors

Response to Reviewer 1

To Dr. Murdoch: Thank you for your careful review of our manuscript and your suggestions to improve it. Below we have responded to your individual points and described revisions made in light of these suggestions.

1. My main comment relates to the lack of detail of the DRC healthcare system that might provide some insight into the findings. Much of the information in the setting section should be...
moved to the introduction and the authors could expand on the contextual issues in the DRC that are likely to shape nurse's performance. The analysis attempted to identify factors associated with higher adherence to the guidelines but these are generic factors which apply to any country and healthcare system. As the authors acknowledge in the discussion, it is difficult to know how to improve adherence to IMCI and they recognise the limitations of focusing solely on further training. Whilst I do not think the authors can address this for the purposes of this publication I think it is worth discussing that unless we situate observational data of this kind within specific socio-historical frameworks, that are systematically investigated as part of the research, we will continue to isolate nurse performance from the contextual conditions that constrain or enable that performance to take place.

Thank you for highlighting the critical importance of local context for this analysis, and apologies for the lack of detail on this issue in the original manuscript.

We have expanded our discussion of the DRC healthcare system in the introduction (p 3) and methods (pp 4-5), bringing in additional references to provide further context. For example, we have expanded the discussion of the unique health workforce challenges in the DRC. There is a highly unequal distribution of health providers across the DRC, with a plethora of providers in areas with high population density and a lack of certain cadres of providers in more remote areas. Many health providers in the DRC are trained in programs that are not regulated by the Ministry of Health.

In addition, we have added text to the discussion section on the importance of considering the contextual challenges that constrain provider performance (pp 13-15).

2. I was interested in how the team used tablets to collect disease information. I would like to read more on what data was collected and how that was captured. What format was the data (i.e. freetext, tickboxes etc) and was it recorded using an App or other means? Were questions asked recorded verbatim and if so, how was this done? How was information recorded by providers obtained? Was this via IMCI checklists?

Thank you also for this comment – accurate data collection on these processes is indeed not straightforward. For our study, disease information was captured on tablets using a structured checklist, which included tick boxes for (a) whether the provider asked a particular question or conducted a particular test, and (b) the patient’s response to the question or the result of the test. The checklist was programmed into tablets for data collection using the Open Data Kit (ODK) software. The checklist was completed through direct observation during the child’s visit with the provider. For example, one question on the checklist asks, “Did the provider ask the caregiver about the duration of the child’s fever?” If the answer to this question is “yes,” then the observer is prompted to answer the next question on the checklist, which asks, “For how long has the child had a fever?” Questions and responses were not recorded verbatim but, rather, using the multiple choice options on the checklist. Enumerators were trained to fill in the observation checklists in a consistent way.

The checklist does have some places for free text entry, where providers’ or caregivers’ responses may differ from the options available on the checklist. For example, in the question
asking how the provider diagnosed the patient, there is an option for “other, please describe” where the observer can enter free text.

We have expanded the description of this process in the Methods section on page 7, and provided a link to the data collection tools online.

3. Did you conduct an inter-rater reliability check your classification of cases? If not then how do we know your classifications are reliable?

Apologies for the lack of clarity. The classification in our paper is directly based on the IMCI guidelines and mechanically codes cases based on the quantitative checklist described above. For example, all patients whose caregiver reported that they had cough or difficulty breathing, and who had any of the four general danger signs (lethargy or loss of consciousness, convulsions, inability to drink or breastfeed, vomiting all food) or stridor, as recorded in the quantitative checklist, were coded as “severe pneumonia or other respiratory infection” cases per the IMCI protocol. This approach has advantages and disadvantages vis-à-vis other methods, such as diagnosis by an IMCI expert at the end of the child’s visit. On one hand, the classification approach we used is objective and not subject to interviewer bias (or to the bias of one particular IMCI expert). On the other hand, many cases are missing symptom information and are therefore not classifiable using this approach. It is also possible that assessors made coding errors during the direct observation – coding by two independent reviewers would have been great to assess inter-rater reliability, but was unfortunately not feasible in our study setting. We have included more detailed discussion of these pros and cons in the Discussion section on page 14.

Response to Reviewer 2

To Dr. Edward: Thank you for your insightful comments on our manuscript. Below we have responded point-by-point to your comments and described how we have revised the manuscript accordingly.

1. Sampling of children in facilities and hospitals is not clear, how were the one and five under-5 patients selected?

Apologies for the lack of clarity. During their visits to sampled health facilities, enumerators collected several different forms of data through separate modules. These modules included facility assessments, direct observation of under-5 and antenatal care, and caregiver exit interviews. Under-5 patients were selected for participation based on their presence at facilities at the time of the assessment. In small facilities, direct observations were done for all under-5 patients. In larger facilities, under-5 cases were randomly selected based on interviewer availability. We have added a description of this in the Methods section on page 6.

2. What was the average daily pt load in these facilities?
Great question: sampled facilities reported an average of 101 patients under-5 in the preceding month (SD=125). Somewhat surprisingly, volume is higher in health centers (103 patients on average, SD=129) than hospitals (86 patients on average, SD=82). This difference may be driven by higher prices in hospitals. We have added this information to the Methods section on page 6.

3. A brief description of the health system, workforce challenges, providers trained in IMCI, system readiness in terms of availability of commodities and essential equipment, patient factors would be helpful to appreciate the limitations in capacity for optimal service delivery. Health providers may not have performed the necessary tests and assessments due to various factors, unavailability of commodities, patient load etc.

Thank you for this suggestion. We have included a more detailed discussion of the health system context in the introduction (pp 3-4) as well as in the discussion section (pp 13-15) where we describe the different potential explanations for the observed low quality care.

4. What was the major objective and focus of the results based financing strategies? Were providers or facilities incentivized to improve quality of care, service utilization etc.

The goals of the results-based financing strategy are to incentivize facilities and providers to improve service delivery quality and coverage. Providers and facilities both receive reward payments for performance on a set of quality and service delivery volume indicators. The evaluation of the results-based financing scheme is still ongoing.

It is important to highlight here that This paper analyzes data from the baseline survey, before the RBF program was introduced. Therefore, the RBF program is relevant to our sample selection but not to the provider behavior that we observed. The endline survey for the RBF program will be conducted in 2020. We have clarified this in the Methods section on page 5. We have also added a description of RBF programs more generally to the Discussion section on page 15-16.

5. In the background or discussion, section, it would be helpful to describe the status of iCCM in DR Congo, to reflect on the care continuum.

The DRC has scaled up the iCCM strategy, but the majority of children in the catchment area for our study facilities seek care directly at a facility rather than from a community health worker. We have added a sentence about this to the Methods section on page 5.

6. What are the specific recommendations to be instituted for policy and programming for IMCI? The concluding statements need further clarity.

Our findings indicate that there is a need for interventions to focus not only on improving the coverage of health care services, but also on improving quality. Evidence from other studies indicates that health worker training programs have generally not been successful in significantly improving quality, so other strategies are needed. While the evidence base on what works to improve quality is very limited, interventions that increase provider motivation such as Results-
Based Financing have shown promising results, as have interventions that involve close monitoring of providers along with provision of feedback. We have added concluding statements to this effect on page 15.

7. Provincial, facility, provider level and urban/rural variations are not described. Did some provinces have better health system capacity, proportion trained in IMCI, better workforce capacity, better access, different patient characteristics, etc. Data in tables and charts requires additional discussion, esp where results are significant.

Apologies for the lack of detail on subsample results in our original manuscript. We did not observe substantial variation in quality of care for children with severe disease by provider type, urban/rural, or facility type. We have added more information describing provincial variation in our sample in the Discussion section on page 13.

8. The prevalence of various conditions and comparison of results from other studies will be helpful to see how these results corroborate with other studies in DR Congo.

We have added a sentence about the proportion of child mortality that is caused by the diseases we study in the methods section, on page 4.

We would like to highlight thought that it is difficult to compare estimates of severe disease prevalence from this study to estimates from other studies. Out of the 1,180 patients in our sample (who were successfully merged with the exit survey), severe disease per the IMCI guidelines could be ruled out in 70 cases (6%), ruled in in 366 cases (31%), and could not be determined in 814 cases (69%). Of the 366 cases, 322 (88%) had signs of severe febrile disease, 189 (52%) had signs of severe pneumonia, and 19 (5%) had signs of severe dehydration. The reason why so many cases could not be determined is that we only have information on the symptoms that the provider asked about or tested during the visit. Among the proportion of patients who were sufficiently assessed to rule in or out severe disease, we find very high prevalence of severe disease (84%). This may be because patients with milder disease do not seek care at health facilities, or because a large proportion of the “undetermined” cases are negative. Other studies looking at the prevalence of severe disease among patients at health facilities in similar settings have used a variety of methods, and estimates have varied widely (e.g. 61% severe disease among patients with pneumonia, malaria, or diarrhea in rural Tanzania (1), 10% severe disease among patients visiting facilities in a multi-country sample from Uganda, Tanzania, and Niger (2)). We have added a brief explanation of this to the discussion section on page 14, and recommended against interpreting our findings as an estimate of the prevalence of severe disease.
References
