Reviewer’s report

Title: Never again? Challenges in transforming the health workforce landscape in post-Ebola West Africa

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Reviewer: Erin Fraher

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Major edits

This paper tackles the important topic of quantifying the effect on workforce supply, distribution and cost of the workforce investment plans in Liberia, Sierra Leone and Guinea. My major concern with this manuscript is the lack of detail on the sources of data and methods used in the analysis, particularly for population estimates, wage, attrition, employment and training cost data used to generate the baseline and scenarios.

Methods: While the authors note that the baseline 2015 workforce data were derived from payroll data, they note on page 5 and 6 the limits of these data for the analysis. It would be helpful to the reader to have some estimates of the degree to which ghost workers, private employment and payment by NGOs could potentially affect the estimates.

The methods say "lack of defined and cross-country comparability of rural and urban areas in Sierra Leone and Liberia were managed by defining the region including the capital city as urban and all other areas as rural". The authors note that Guinea's internal classification system of urban and rural was used. It would be helpful to have some statement about the degree to which the two classification methods are comparable in terms of the distribution of population in the three countries' urban and rural areas.

The analysis relies extensively on "density rate" calculations from population data but the population baseline data or forecasts are never shown in any of the tables.

The analysis shows scenarios related to attrition, training output, training drop out and public sector employment but the data behind these scenarios are not sourced, nor are they shown or explained in the methods or analysis. This makes it very difficult, for example, to interpret the "theoretical scenarios of attrition and employment" shown Table 4.

The manuscript contains cost and wage estimates and although some information is given on page 13 as to the sources of the data, it would be helpful to show the data. I had a hard time understanding how a growth in workforce size, as described in this paper, would result in a declining proportion of total health expenditures accounted for by the wage bill. This assumes if wage is the numerator and total health is the denominator that the total health bill is growing
faster than the wage bill? The notes in Figure 5 might be better included in the methods section with a more detailed explanation of how these calculations were derived.

Results:

The text on page 6 says that says that Liberia fares better than Sierra Leone or Guinea in terms of raw numbers of all health workers but Figure 1a seems to suggest that Sierra Leone and Liberia are quite similar in terms of total workforce size, and Guinea lags behind. However, as noted in the text, Liberia fares better (fig 1b) in numbers of doctors, nurses and midwives.

Table 1: Change title to be clear that these are numbers of doctors, nurses and midwives per 10,000 population. It would be helpful to put the per 1,000 pop rates for Liberia, Guinea and Sierra Leone on the table with the regional rates.

Table 2: check the match between the data in the table and the data in the text. For example, page 8, line 47 says that Liberia would need to double its number of doctors, nurses and midwives but 6172-3555=2617 and 2617/3555= 73.6% which is not a doubling of the workforce. Similarly, the text says that Guinea would need to triple its workforce but 10,897/2651 is a workforce 4x the baseline or a 311% growth rate over baseline.

Column 2 in Table 2 which is labelled "Current Implications" gives the target date for achieving the growth. I'm assuming the baseline was 2015. When I make this assumption from a baseline of 2015-2021 or 2015-2024 to give me the numbers of years of growth to the target date, I can't replicate the annual growth rates in the table.

The most striking finding of the data in Table 3 is the huge growth needed to get from the current stock of doctors, nurses and midwives (I'm assuming in 2015) to the total required in 2020 to get to 2.5 per 1,000 density. These gains do not seem feasible and may leave the reader wondering why to even consider trying to reach that target.

Table 5: It is hard to interpret the data in Table 5 since no information is given about the wages and cost of training for the different providers in the three countries either in the methods section or elsewhere in the paper (except in the conclusion where there is a sentence on physician wage and training costs in Guinea). The 2025 cost estimate for Liberia in the baseline scenario is $5.6 million dollars. It is way out of line with the trends from 2015-2029, is this a typo?

Table 6: This table would be improved by showing numbers in rural and urban at baseline and in 2021 so the reader can understand what is driving the percentages in the table. For example, the table implies that Liberia has a lot of midwives in rural areas already since it requires only a 2.4% growth rate to achieve the target?

There are a lot of charts and figures in this manuscript. If the authors' conclusions relate to the need to: 1. Increase the supply of health workers; 2. Address the distribution of health workers; and 3. Change the mix of providers, it might be advisable to tighten up the background/intro, methods, and findings to target these conclusions.
Minor edits

The background section is exceptionally well-written and focuses on the "policy window" (Kingdon) that the Ebola crisis offers African countries to invest in their health workforces. However, the issue of Ebola is not returned to in the discussion or the conclusion of the paper.

I struggled a bit with how the term 'density' used in the paper. For example, on page 6, line 56, it says Liberia has the highest density of all three countries and the is only country close to half the African average. Do the authors mean to imply that because there is high population density in Liberia (as opposed to a large population) so workforce supply per pop should be higher?

Define EHRP on page 4, line 5 before using the acronym on page 4, line 12

The term "fiscal space" does not translate for me and may not for other readers.

Pg 8, line 24, be clear that what is meant by current regional density means the African density (Table 1)

Tale 3: label "stock" as "current stock in 2015"

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