Author's response to reviews

Title: Human resources for health planning and management in the Eastern Mediterranean region: facts, gaps and forward thinking for research and policy

Authors:

Fadi El-Jardali (fe08@aub.edu.lb)
Diana Jamal (dsj00@aub.edu.lb)
Ahmad Abdallah (aa59@aub.edu.lb)
Kassem Kassak (kkassak@aub.edu.lb)

Version: 2 Date: 9 January 2007

Author’s response to reviews: see over
Dear Managing Editor,

Thank you for the evaluation of my manuscript. I greatly appreciate the opportunity provided by the Human Resources for Health Journal in considering my manuscript for publication, as I thank the reviewers for their remarks and suggestions. I found them very constructive and helpful and I have taken them all into consideration and incorporated them in the text of the manuscript where appropriate and as indicated below in the point-by-point description of the changes:

**Reviewer 1: Dr. Raymond Pong**

Major Revisions as per the reviewer’s comments:

1. **Justify the use of the East Mediterranean Region (EMR) in the manuscript**

We agree with the reviewer that EMR countries are not homogeneous. In our manuscript, we used this region for the following reasons:

The World Bank classified most of EMR’s twenty-two countries (61%) as Low or Low Middle Income Countries (LMICs). As shown the in the table below, this region has the second lowest human resources for health (HRH) density, right after Africa, among the six administrative regions of the WHO (See Table 1).
Currently, many EMR countries are either implementing health reform plans or in the process of doing so. Evidence suggests that successful health system reform in any country depends on the provision of effective, efficient, assessable, sustainable and high quality services by a health workforce that is sufficient in number, appropriately-trained and equitably-distributed. For several EMR countries, a limited understanding of HRH issues, challenges and priorities may hinder sustainable health sector reform. Many developed countries have researched the nature and scope of HRH planning and management, particularly, its problems, needs, gaps and impacts on health status. Yet for many EMR countries, almost nothing is known. In our manuscript, we make use of the most recent and available data (both global and regional) to generate and analyze evidence on HRH in the context of EMR. HRH in EMR is an underdeveloped field where evidence base has to be established.

There is paucity of research articles concerning the health workforce in EMR countries. Much of the research related to this region addresses the health workforce issue either at a country specific level for very few countries in the region, but not for the low income and high income countries in the EMR. For instance, a report published in February 2003 by United States Agency for International development deals with the Health Human Resource Crisis in Africa. No similar reports for the EMR region have


---

### Table 1: Density of the Global health workforce across WHO administrative regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Total health workforce</th>
<th>Density (per 1000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>1 640 000</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Eastern Mediterranean</strong></td>
<td>2 100 000</td>
<td><strong>4.0</strong></td>
</tr>
<tr>
<td>South-East Asia</td>
<td>7 040 000</td>
<td>4.3</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>10 070 000</td>
<td>5.8</td>
</tr>
<tr>
<td>Europe</td>
<td>16 630 000</td>
<td>18.9</td>
</tr>
<tr>
<td>Americas</td>
<td>21 740 000</td>
<td>24.8</td>
</tr>
<tr>
<td>World</td>
<td>59 220 000</td>
<td>9.3</td>
</tr>
</tbody>
</table>

‡Adapted from WHR 2006, page 5
been found. Such work can help fill an information gap concerning the health workforce. Addressing HRH at a regional level can help EMR countries to formulate regional strategies for improving HRH planning and management. Such regional strategies will take into consideration issues and challenges in each of the EMR countries, rather than trying to resolve one country’s HRH shortage (mostly high income EMR countries) by actively recruiting health workforce from Low income EMR countries, thus aggravating the problems in those countries. Also, referring to the region as a whole would be an opportunity to present the wide variations among EMR countries with respect to physicians and nurses (EMR is a developing region and has a unique combination of low income, low-middle income, middle income and high income countries). A discussion about the variation is included in some sections in the manuscript.

2- Issues around the inclusion of Afghanistan, Iraq, Somalia and Sudan:

For the EMR, we refer to twenty-two countries. They are: Afghanistan, Bahrain, Cyprus, Djibouti, Egypt, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen. As shown in our revised manuscript, significant differences exist in health status indicators within the EMR. Of particular interest are the cases of Somalia and Afghanistan which were observed to have the lowest HRH densities in the region. The infant mortality rate (IMR) in these two countries is respectively twice and thrice the regional and global averages, and their under five mortality rate (U5MR) was found to be approximately four and five times the regional and global averages, respectively. This might be attributed to the recent wars in these countries and may not necessarily be a result of low HRH density. That is why, we removed both countries from our analysis. While war conflicts exist in Iraq and Sudan as well, we did not remove them from our analysis since their mortality rates are not as extreme as those of Afghanistan and Somalia. Actually, as shown in the manuscript, these rates are even lower than some other EMR countries that are not currently enduring war conflicts.
3- **Examine the relationship between health personnel supply and health status by controlling for socioeconomic factors:**

As shown in the revised manuscript, results of the Pearson correlation revealed that Physician and Nurse Density, and female literacy in EMR countries were significantly correlated with lower mortality rates and higher life expectancy. However, poverty, income, and health expenditure were not significantly correlated with health status indicators for EMR countries. This finding runs opposite to other study findings that used global data to test such relationship. This could be explained by the fact that Pearson correlation does not allow for controlling for the effect of other variables. While we were not able to regress the EMR data due to the limited number of cases (22 countries), we made use of the Global data to test the relationship between our selected variables for both Low and Low-Middle Income countries (LMICs) and Middle and High Income countries (MHICs). Results strongly confirm the importance of HRH and other determinants of health in affecting health outcomes. An implication of our results is that investing and pouring in more money to increase the number of physicians and nurses in EMR countries, particularly the LMICs ones, will be less effective or, to a certain extent, wasted without dramatic investments in socioeconomic determinants of health. Results and implications were interpreted in the context of EMR countries. Details are shown in the revised manuscript.

4- **Provide sufficient linkages between the objectives of the paper:**

The objectives of the paper were revised to ensure linkages. As shown in the revised manuscript, the objectives are to: (1) lay out the facts on what we know about the HRH for EMR countries; (2) generate and interpret evidence on the relationship between HRH and health status indicators for LMICs and MHICs in the context of EMR; (3) identify and analyze the gaps (i.e. what we do not know) and (4) provide forward thinking by identifying priorities for research and policy. The first objective will be achieved using univariate and bivariate (Pearson Correlation) analysis of the most recent regional data for the 22 EMR countries. The second objective will be realized through multivariate analysis techniques (Linear Regression) of the most recent global data. The remaining two objectives will be achieved by reviewing and analyzing published HRH
literature in developed and developing countries. This literature includes major health reports on the EMR, published by researchers, stakeholder organizations and agencies including the WHO.

Minor Revisions as per the reviewer’s comments:

Minor revisions

1- **Specify data sources and time period**

This table was presented in the revised manuscript to illustrate data sources:

**Table 2: Sources of data used in this analysis**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependant</td>
<td></td>
</tr>
<tr>
<td>IMR</td>
<td>World Fact Book 2005</td>
</tr>
<tr>
<td>U5MR</td>
<td>World Health Report 2006</td>
</tr>
<tr>
<td>MMR</td>
<td>World Health Report 2005</td>
</tr>
<tr>
<td>LE</td>
<td>World Health Report 2006</td>
</tr>
<tr>
<td>Independent</td>
<td></td>
</tr>
<tr>
<td>Physician density</td>
<td>World Health Report 2006</td>
</tr>
<tr>
<td>Nurse density</td>
<td>World Health Report 2006</td>
</tr>
<tr>
<td>Female Literacy</td>
<td>United Nations’ Millennium Development Goals website</td>
</tr>
<tr>
<td>Income</td>
<td>World Health Organization Statistical Information System</td>
</tr>
<tr>
<td>Poverty</td>
<td>World Health Organization Statistical Information System</td>
</tr>
<tr>
<td>Health Expenditure</td>
<td>World Health Report 2006</td>
</tr>
</tbody>
</table>

The time period is not homogenous across all countries in the EMR; footnotes specifying the year each variable represents were inserted below Figures 1 and 2 in the revised manuscript.

2- **Reconsider title for Table 2:**

The values in Table 2 (in earlier version) reflect Pearson r. The notation used previously was an error on our part and was corrected for in the revised version of the manuscript. Please refer to table 4 in the revised manuscript.

3- **Language corrections**

The manuscript was edited and revised. Language corrections were made accordingly.
Reviewer 2: Dr. Elsheikh Mahgoub

1- Paper relies heavily on the World Health Report 2006

The WHR 2006 is the most recent and comprehensive report that addresses human resources for health at the global level. The first draft of our manuscript was prepared prior to the report’s publication. However, upon its publication, we made reference to it and used some quotations in order to put readers in the context of the most recent evidence based thinking and directions in terms of HRH at the global level. Our aim was not to duplicate but to build on, support and complement what was reported in the WHR 2006 and use and interpret data in the context of the EMR countries. As discussed in the revised manuscript, we took this comment into consideration and made the revisions accordingly.

2- Revise the assumption that no work was done previously on HRH in EMR

There is paucity of research articles concerning the health workforce in EMR countries. We acknowledge that much of the research related to HRH in this region addresses the health workforce issue either at a country specific level for very few countries in the region, but not for the low income and high income countries in the EMR. For instance, some research work has been done in exploring nurse satisfaction, nurse and physician migration, nursing leadership and educational programs in few EMR countries.

As per the reviewer’s suggestion, we searched the EMRO website in an attempt to find more work done in the region, but with limited success. For example, the EMRO Director General Annual Report for 2005 refers to some work done on HRH in the region and to the considerable progress made in the EMR in terms of mapping of HRH in 13 EMR countries. The report also refers to the national observatories that have been established to monitor HRH development and consequently formulate regional strategies for improving HRH planning and management. So far, this work has not been widely documented and is more of a country-based than a regional...
initiative. The report refers to some country-specific work conducted by consultants. Reports have not been made available and accessible by the public including researchers. As you will note, we referred to this progress in the revised version of this manuscript.

From a policy perspective, regional reports on HRH are important. For instance, a report published in February 2003 by United States Agency for International development deals with the Health Human Resource Crisis in Africa. No similar reports for the EMR region have been found. Such work can help fill an information gap concerning the health workforce. Addressing HRH at a regional level can help EMR countries to formulate regional strategies for improving HRH planning and management. Such regional strategies will take into consideration issues and challenges in each of the EMR countries, rather than trying to resolve one country’s HRH shortage (mostly high income EMR countries) by actively recruiting health workforce from Low income EMR countries, thus aggravating the problems in those countries. Also, referring to the region as a whole would be an opportunity to present the wide variations among EMR countries with respect to physicians and nurses (EMR is a developing region and has a unique combination of low income, low-middle income, middle income and high income countries). A discussion about the variation is included in some sections in the manuscript.

3- **Decrease repetition of some statements**

    The paper has been revised and edited to eliminate such repetitions. We hope you find those changes satisfactory.

4- **Study Variables selected for the analysis:**

    The independent variables included in our analysis are the following:

    - Physician and nurse densities: they collectively account for the majority of healthcare providers in most countries;
- Gross national income: it captures a multitude of factors that affect mortality rates such as nutrition, access to safe water, sanitation, housing, etc.

- Percentage of the population living below the poverty line ($1): higher poverty rates are associated with higher mortality rates;

- Female adult literacy: it is known to reflect behavior and lifestyle which in turn influence mortality rates; and

- Total expenditure on health: it represents the resources spent on health, which may influence health outcomes

The dependent variables are: Infant mortality rate (IMR); Under five mortality rate (U5MR); Maternal mortality rate (MMR); and Life expectancy (LE).

These variables were selected since they were found to have an effect on health outcome indicators in previous studies. As shown in the revised manuscript, we make use of the most recent and available data (both global and regional) to generate and analyze evidence on HRH in the context of EMR. To our knowledge, no study has been done to test relationship between HRH and health status indicators for LMICs and MHICs in the context of EMR.

3- **Abbreviation EMRO**

The abbreviation EMRO was changed to EMR throughout the revised manuscript. Abbreviations of other WHO regions were also modified.

4- **EMR countries are 22 and not 24**

We revised this accordingly. For the EMR, we refer to twenty-two countries in the revised manuscript. They are: Afghanistan, Bahrain, Cyprus, Djibouti, Egypt, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya,
Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.

5- Afghanistan and Somalia have had civil war for years so mortality rates are not surprising

Both countries were removed from our analysis in revised manuscript. As shown in our revised manuscript, significant differences exist in health status indicators within the EMR. Of particular interest are the cases of Somalia and Afghanistan which were observed in to have the lowest HRH densities in the region. The infant mortality rate (IMR) in these two countries is respectively twice and thrice the regional and global averages, and their under five mortality rate (U5MR) was found to be approximately four and five times the regional and global averages, respectively. This might be attributed to the recent wars in these countries and may not necessarily be a result of low HRH density. That is why, we removed both countries from our analysis.

6- Total health expenditure as % of GDP was not found to be significantly correlated with mortality rates

Results of the Pearson correlation revealed that Physician and Nurse Density, and female literacy in EMR countries were significantly correlated with lower mortality rates and higher life expectancy. However, poverty, income and health expenditure was not significantly correlated with health status indicators for EMR countries. This latter finding runs opposite to other study findings that used global data to test such relationship. This could be explained by the fact that Pearson correlation does not allow for controlling the effect of other variables. While we were not able to perform regression analysis on the EMR data due to the limited number of cases (22 countries), we made use of the global data to test the relationship between our selected variables. Results strongly confirm the importance of HRH and other determinants of health in affecting health outcomes. An implication of our results is that investing and pouring in more money to increase the number of physicians and nurses in EMR countries, particularly the LMICs ones, will be less effective or, to a certain extent, wasted without dramatic investments in socioeconomic determinants
of health. Results and implications were interpreted in the context of EMR countries. Details are shown in the revised manuscript.

7- **Revise the paragraph on numbers of educators and trainers on page 13.**

This section of the manuscript was revised accordingly.

8- **Conclusion needs revisions**

This comment was addressed in the revised manuscript. The conclusion now appears as follows:

The EMR has the second lowest HRH density when compared to the other regions. Results demonstrate significant disparities in physician and nurse densities within the EMR, particularly between LMICs and MHICs. Besides, significant differences exist in health status indicators within the said region.

Our results strongly confirm the importance of HRH and other determinants in affecting health outcomes. An implication of our results is that investing and pouring in more money to increase the number of physicians and nurses in EMR countries – particularly the LMICs – will be less effective and, to a certain extent, wasted if not accompanied by dramatic investments in socioeconomic determinants of health. This is the case as HRH cannot be looked at in isolation from other equally important determinants of health. Investing in HRH, in addition to increasing health expenditure, expanding female education and raising national income will help countries, particularly the LMICs, to achieve health-related MDG. There are no shortcuts for achieving the health-related MDG. For LMICs, health outcome indicators will get worse, not better, if countries do not address HRH as an integral component of their health reform programs.

Achieving the MDG will not occur unless there is a right mix of health workforce with the right skills in the right place at the right time. This means that essential information beyond the mere numbers of nurses and physicians in the EMR is required. More supply of health workers in the short term may not be as effective as better-management and utilization of the existing stock of health workers in EMR
countries, particularly the LMICs. For example, improving the work conditions for the existing health workforce can improve recruitment and retention, staff and patient satisfaction, quality of care as well as patient outcomes.

HRH issues in many EMR countries are not well-investigated in research. This paper identifies basic questions for further research. Health workforce research is needed in EMR countries in order to generate evidence to inform policy decisions, including the development of country-specific HRH policies and strategies.

9- **Language editing**

The paper was revised and edited for language correction.

Please find enclosed the revised version of the manuscript “Human Resources for Health Planning and Management in the Eastern Mediterranean Region: Facts, Gaps and Forward Thinking for Research and Policy”. I hope you will find our response satisfactory.

Sincerely,

Fadi El-Jardali, MPH, PhD
Assistant Professor
Department of Health Management and Policy
Faculty of Health Sciences
American University of Beirut