Overview of medical schools in the Eastern Mediterranean Region of the World Health Organization

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لمحة عن كليات الطب في إقليم شرق المتوسط لمنظمة الصحة العالمية

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الخلاصة: تتسم البلدان الاثنان والعشرون في إقليم شرق المتوسط بتنوع ملحوظ، ثقافياً واقتصادياً. وفي هذه الورقة تجميع للبيانات المنشورة حول أوضاع كليات الطب في الإقليم بهدف تقديم المعلومات اللازمة للمساعدة في التخطيط المستقبلي. وقد جمع الباحثان المعلومات من الدليل الدولي للتعليم الطبي، ودليل ابن سينا، ودليل تعليم المهن الصحية في إقليم شرق المتوسط لمنظمة الصحة العالمية، وقاعدة المعطيات الخاصة بكليات الطب في المعهد الدولي للتعليم الطبي. ولاحظ الباحثان وجود اختلافات في اللغات التي تستخدم في إملاء المعلومات (وأن بعض الكليات تستخدم أكثر من لغة واحدة)، وفي كثافة كليات الطب لكل مليون نسمة. ولم يكن هناك علاقة بين كثافة وعدد كليات الطب وبين عدد الأطباء العاملين، الذي يتراوح بين 2.1 لكل 10 000 في أفغانستان و28.3 في مصر. وتمس الحاجة إلى دليل محدَّث لكليات الطب في الإقليم.

ABSTRACT The 22 countries of the Eastern Mediterranean Region (EMR) exhibit considerable diversity, both culturally and economically. This paper collated published data on the status of medical schools in the Region to provide information to assist in future planning. Information about medical schools was obtained from the *International Medical Education Directory*, the *Avicenna Directory*, the WHO/EMR *Health Professions Education Directory* and the Institute for International Medical Education's *Database of Medical Schools*. The registered number of medical schools in the Region varied according to the different directories. There were variations in the language used for instruction (some used more than one language) and the density of medical schools per million population. The density and number of medical schools in the country were not related to the number of working physicians which ranged from 2.1 per 10 000 population in Afghanistan to 28.3 in Egypt. An updated directory of medical schools in the Region is much needed.

Tour d'horizon des facultés de médecine dans la Région de la Méditerranée orientale de l'Organisation mondiale de la Santé

RÉSUMÉ Les 22 pays de la Région de la Méditerranée orientale offrent une diversité considérable, à la fois culturelle et économique. Le présent article a recueilli des données publiées sur la situation des facultés de médecine dans la Région afin de fournir des informations qui contribueront à la planification dans les années à venir. Les informations concernant les facultés de médecine ont été obtenues à partir des annuaires *International Medical Education Directory*, *Avicenna Directory*, *Health Professions Education Directory* du Bureau régional de l'OMS pour la Méditerranée orientale et de la base de données *Database of Medical Schools* de l'*Institute for International Medical Education*. Le nombre enregistré de facultés de médecine dans la Région variait en fonction des différents annuaires. Il existait des différences dans la langue utilisée pour l'enseignement (certains établissements utilisaient plus d'une langue) et dans la densité des facultés de médecine par million d'habitants. La densité et le nombre de facultés de médecine par pays n'étaient pas liés au nombre de médecins en activité, compris entre 2,1 et 28,3 pour 10 000 habitants en Afghanistan en Égypte respectivement. Il est grandement nécessaire de disposer d'un annuaire actualisé des facultés de médecine dans la Région.

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Introduction

The Eastern Mediterranean Region (EMR) of the World Health Organization (WHO) is composed of 22 countries, including Palestine. The Region's countries are located on the continents of Africa (Djibouti, Egypt, Libya, Morocco, Somalia, South Sudan, Sudan and Tunisia) and Asia (Afghanistan, Bahrain, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen) [1]. These countries exhibit considerable diversity, both culturally and economically. Economically, the differences are evident. According to the World Bank classification, 5 countries in the region are low-income (Afghanistan, Pakistan, Somalia, Sudan, Yemen), 13 are middle-income (Djibouti, Egypt, Islamic Republic of Iran, Iraq, Jordan, Morocco, Lebanon, Libya, Oman, Syrian Arab Republic, Tunisia, West Bank and Gaza, Saudi Arabia) and 4 are high-income (Bahrain, Kuwait, Qatar and United Arab Emirates). South Sudan was not included in this classification [2]. These variations produce great discrepancies in the health of the countries' respective populations, as has been shown by the World Bank health data [3]. These variations are also expected to affect many other aspects of people's daily life.

Medical education is a field where variations are also expected, because the economic and health status of a country and its population are among the major determinants for the need to establishing medical schools. The stimulus for this report was the distinguished work of Boulet et al., which provided an overview of medical schools throughout the world, categorized by geographical continent [4]. The objective of the current report was to collate published data on the status of medical schools in a specific WHO Region— the EMR. This may be a more useful way to classify schools as most aspects of health planning are based on the WHO regional groups of countries.

Methods

All of the resources mentioned here were accessed in April 2012. The principal data about medical schools in the EMR for this report were obtained from the *International Medical Education Directory* (IMED) published by the Foundation for Advancement of International Medical Education and Research (FAIMER) [5]. The following data were collated about the medical schools: the number of medical schools, their start date and their activity (i.e. if the school was conferring degrees at the time of the review). No data could be found for the curriculum of each medical school.

The number of medical schools (i.e. schools which offer MBBS or MBBCh degrees, whether undergraduate or graduate) was verified in several other key databases: the *Avicenna Directory* hosted by the University of Copenhagen [6], the *Health Professions Education Directory* (HPED) published by the World Health Organization Regional Office for the Eastern Mediterranean (WHO/EMRO) [7] and the Institute for International Medical Education's (IIME) *Database of Medical Schools* [8]. South Sudan was not registered in any of these directories.

The country density of medical schools was calculated by dividing the number of active (still graduating) medical schools registered in *IMED* by the estimated 2009 population for each country and expressed per 1 000 000 population. Population estimates were taken from the WHO/EMRO country profiles [4,9]. For Djibouti, the number of medical schools listed in the HPED was used. The total Regional density was calculated by dividing the total number of medical schools by the total population estimate in the Region.

The number of active medical schools was compared with the estimated number of physicians per 10 000 population in each country in 2009. The number of registered, practising physicians was obtained from the WHO/EMRO country profiles [9].

Descriptive data were used to describe the situation of the medical schools in EMR.

Results

Number of medical schools

The registered number of medical schools in EMR varied according to the different directories. The total number of registered schools was 257 (9 of which had stopped graduating students) in the IMED, 253 in the *Avicenna Directory*, 219 in EMRO's HPED and only 158 in the IIME *Database* (Table 1). According to IMED, the database with the highest number of medical schools recorded, the number of active medical schools ranged from only 1 in Qatar and 1 in Somalia, to 51 in the Islamic Republic of Iran. More than 50% of these medical schools were located in just 4 countries: Islamic Republic of Iran, Pakistan, Saudi Arabia and Sudan.

Number of medical schools in relation to size of population

Calculating the number of medical schools per population showed great variations in density (Table 2). The Pakistan and Islamic Republic of Iran had almost the same number of medical schools (50 and 51 respectively) despite the fact that Pakistan's population was more than double that of Iran (164 million versus 74 million). Similarly, Egypt's population (77 million) exceeded that of Islamic Republic of Iran (74 million), yet the number of active schools in Egypt was far below

Table 1 Number of medical schools in countries of the Eastern Mediterranean Region according to 4 different directories

Country	IMED[b]		Avicenna Directory[c]	HPED[d]	IIME Database[e]
	Registered schools	Active schools			
Iran (IR)	56	51	47	44	46
Pakistan	52	50	67	26	33
Saudi Arabia	25	25	16	17	5
Sudan[a]	25	25	27	24	14
Egypt	21	19	22	19	11
Iraq	15	15	16	23	12
Libya	11	11	7	11	4
Lebanon	7	7	5	6	5
Syrian Arab Republic	7	7	7	6	3
Afghanistan	6	6	6	5	4
Yemen	6	6	6	6	2
United Arab Emirates	5	5	4	4	2
Jordan	4	4	5	4	2
Morocco	4	4	5	4	4
Tunisia	4	4	4	4	4
Bahrain	2	2	3	3	1
Oman	2	2	2	2	2
Palestine	2	2	–	4	–
Kuwait	1	1	1	1	1
Qatar	1	1	1	1	1
Somalia	1	1	2	4	2
Djibouti	–	–	–	1	–
Total	257	248	253	219	158

[a]Including South Sudan.
[b]International Medical Education Directory [5]; [c]AVICENNA Directory of Medical Schools, FAIMER [6]; [d] Health Professions Education Directory, World Health Organization Regional Office for the Eastern Mediterranean [7]; [e]Database of Medical Schools 2005, Institute for International Medical Education [8].

that in Iran (19 versus 51). However, for Libya's population of 5 million, there were 11 medical schools, giving the country the highest density of medical schools (1.96 per million) in the Region. The lowest density of medical schools in EMR was in Morocco, with 0.13 per million. The overall density in the Region was 0.44 per million.

Number of medical schools in relation to number of doctors

When relating the number of medical schools to the number of doctors in each country (per 10 000), there also remained interesting discrepancies (Table 2). In Lebanon, there was a high density of medical schools (1.72 per million) and a high number of doctors (35.4 per 10 000), while in Egypt the density of medical schools was only 0.25 per million but the number of doctors was 28.3 per 10 000. Although there were many medical schools in the Islamic Republic of Iran, Pakistan and Sudan, the number of doctors per 10 000 in those countries was among the lowest in the region. In the Gulf countries (i.e. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates), there were large numbers of doctors per population, but the numbers of medical schools were less than in other countries of the Region (with Saudi Arabia being the exception).

Dates of establishment

We were able to determine the date of establishment of 240 medical schools in the IMED and found that the majority of medical schools in the Region opened between 1975 and 1999 (Table 3). There were approximately 7 medical schools that could be considered old-established, 5 of which opened before 1900. These included Kasr Al Aini School of Medicine, University of Cairo (Egypt, 1827), Nishtar Medical College (Pakistan, 1851), King Edward Medical University (Pakistan, 1860), American University of Beirut Faculty of Medicine (Lebanon, 1868) and Université Saint-Joseph Faculté de Médecine (Lebanon, 1883). In total, 131 (52.8%) of the medical schools opened in the period 1975–99 and 59 (23.8%) opened in the past 12 years. The most recently established

Table 2 Number of active medical schools in countries of the Eastern Mediterranean Region in relation to country population and number of doctors

Country	Active medical schools according to IMED[b]	Population (million)	No. of schools per 1 000 000 population	No. of doctors per 10 000 population
Iran (IR)	51	73.7	0.69	8.9
Pakistan	50	163.8	0.31	8.0
Saudi Arabia	25	25.3	0.99	21.5
Sudan[a]	25	35.2	0.71	2.8
Egypt	19	76.8	0.25	28.3
Iraq	15	32.3	0.46	6.9
Libya	11	5.6	1.96	19.0
Lebanon	7	4.1	1.72	35.4
Syrian Arab Republic	7	20.1	0.34	15.0
Afghanistan	6	25.9	0.23	2.1
Yemen	6	22.9	0.26	3.0
United Arab Emirates	5	4.8	1.04	27.9
Jordan	4	6.0	0.67	24.5
Morocco	4	31.5	0.13	6.2
Tunisia	4	10.4	0.38	11.9
Bahrain	2	1.1	1.80	21.1
Oman	2	2.7	0.73	18.1
Palestine	2	3.9	0.50	17.4
Kuwait	1	3.6	0.27	18.0
Qatar	1	1.6	0.61	24.5
Somalia	1	8.4	0.12	–
Djibouti	–	0.8	1.22	–
Total	248	560.6	0.44	–

[a] *Including South Sudan.*
[b] *International Medical Education Directory [5].*

medical schools were in Saudi Arabia and Pakistan.

Language of instruction

Regarding the language of instruction for MBBS degree programmes in the Region's medical schools, English was the dominant language in 246 of the active medical schools registered in the *IMED*. In total, 144 schools (58.6%) indicated that English was the sole language of instruction, 13 (5.3%) used Arabic, 8 (3.3%) used French, 35 (14.2%) used Persian (Farsi) and 6 (2.4%) used Pushto for instruction. The remaining 40 (16.2%) medical schools used more than one language (Table 4). It was not possible to establish if the different languages were used in the same programme or if there were parallel tracks for each language.

Duration of instruction

The duration of instruction to obtain the MBBS degree varied greatly between and even within countries. The majority of the medical schools indicated 6 to 7 years as the duration of instruction, while others were in the range of 4 to 8 years. Some of the medical schools included 1 extra year of internship in their programme.

Discussion

An apparently simple question—What is the number of medical schools in the countries of the EMR?—was not easy to answer in this study, as the numbers in each directory differed greatly, from 248 active schools reported in IMED to only 158 recorded by the IIME Database. Some of the countries' own publications also yielded discrepancies in the figures. For example, in Sudan, the number of medical schools was indicated as 27 in a 2008 publication [10] and 29 in a 2007 publication [11]; these figures are different from those found in the different medical schools' directories. Sudan was not the only country for which these numbers differed. A study of Saudi Arabia indicated that the number of medical schools was 16 in 2010 [12]; however, the number of schools in the IIME Database is 25 and 1 of them was established after

Table 3 Number of medical schools in countries of the Eastern Mediterranean Region by year of establishment

Country	Start date							
	Not registered	Before 1900	1900–1924	1925–1949	1950–1974	1975–1999	2000 and after	Total
Afghanistan	0	0	0	1	1	3	1	6
Bahrain	0	0	0	0	0	1	1	2
Djibouti	0	0	0	0	0	0	0	0
Egypt	0	1	0	1	6	9	2	19
Iran (IR)	2	0	0	6	4	38	1	51
Iraq	1	0	0	1	2	10	1	15
Jordan	0	0	0	0	1	1	2	4
Kuwait	0	0	0	0	1	0	0	1
Lebanon	0	2	0	0	0	2	3	7
Libya	0	0	0	0	2	8	1	11
Morocco	0	0	0	0	1	3	0	4
Oman	0	0	0	0	0	1	1	2
Pakistan	0	2	0	2	8	21	17	50
Palestine	0	0	0	0	0	2	0	2
Qatar	0	0	0	0	0	0	1	1
Saudi Arabia	1	0	0	0	1	4	19	25
Somalia	1	0	0	0	0	0	0	1
Sudan[a]	2	0	1	0	0	18	4	25
Syrian Arab Republic	0	0	1	0	2	1	3	7
Tunisia	0	0	0	0	3	1	0	4
United Arab Emirates	0	0	0	0	0	3	2	5
Yemen	1	0	0	0	0	5	0	6
Total no. (%)	8 (3.3)	5 (2.0)	2 (0.8)	11 (4.4)	32 (12.9)	131 (52.8)	59 (23.8)	248 (100.0)

[a] *Including South Sudan.*

2010, which means that until 2010 the number should be 24.

Medical education in the EMR began early but developed slowly. We found that before 1950, there were 18 registered medical schools in the Region, which were distributed among only 8 countries. The majority of medical schools were established between 1950 and 1999, with the peak being after 1980 [13], which is similar to the trends in other parts of the world [4]. Among the 6 Gulf countries, the first medical school was founded in Saudi Arabia in 1960 [12].

The Islamic Republic of Iran and Pakistan had the largest number of active registered medical schools, making them among the countries with the highest number of medical schools worldwide [4]. The overall density of medical schools in EMR in our review was found to be 0.44 per million population (1 per 2.3 million). Internationally, the density of medical schools was reported by Boulet et al. as 1 per 3.3 million (1 per 1.9 million in Europe, 1 per 4.5 million in Asia and 1 per 6.9 million in Africa) [4]. The number of medical schools in a country, however, did not correlate with the number of doctors per 10 000 population in that country. In some countries, there were large numbers of medical schools but low number of doctors (e.g. Islamic Republic of Iran, Pakistan, Sudan), whereas the opposite was found in other countries (e.g. Lebanon, Egypt, Jordan, United Arab Emirates, Bahrain, Qatar, Saudi Arabia). It seems that the migration of doctors may have a significant effect (either positively or negatively) on the number of doctors. It has been reported elsewhere that expatriate doctors account for 75% of all working doctors in the Gulf countries collectively (30% in Bahrain, 63% in Kuwait, 78% in Oman, 69% in Qatar, 78% in Saudi Arabia, 82% in the United Arab Emirates) [12,14,15].

Boulet et al. documented that the majority (37.6%) of medical schools outside the United States and Canada used English as the language of instruction [4]. This was also true for our study, although English is not the first language of the population in any of the countries in the Region. The overwhelming use of English as the language of instruction in medical schools throughout the world has also been documented in the World Medical Schools Survey [13]. The duration of study in the medical schools of EMR was in the range of 4 to 8 years, which corresponds to the duration and

Table 4 Languages used for instruction in medical schools in countries of the Eastern Mediterranean Region

Language	No. of schools	%	Remarks
Arabic only	13	5.3	Schools in Iraq, Sudan[a], Syrian Arab Republic, Yemen
Arabic & English	19	7.7	Schools in Libya, Saudi Arabia, Sudan[a], Syrian Arab Republic, Yemen
Arabic & French & English	3	1.2	Schools in Syrian Arab Republic
English only	144	58.5	All countries except Afghanistan, Morocco and Tunisia had medical schools that use English
English & French	3	1.2	Schools in Lebanon
English & Farsi	15	6.1	Schools in Iran (IR)
French only	8	3.3	Schools in Morocco, Tunisia
Farsi only	35	14.2	Schools in Iran (IR)
Pushto only	6	2.4	Schools in Afghanistan

[a]*Including South Sudan.*

range of other medical schools throughout the world [4]. Information about the curriculum implemented in medical schools in EMR was not available in any of the directories used, but can be found in country-specific publications about medical schools [11,12,16–18]. Other important points that were missing from the directories were the number of students and the national accreditation status of each medical school.

Conclusion

The definitive number of medical schools in the EMR was not possible to determine from the data recorded in key sources of information, nor was it possible to determine their curricula and status of accreditation. There was some ambiguity with regard to the undergraduate medical programmes in which more than one language was used for instruction.

The information in this report should encourage regional organizations concerned with medical education and health planning, including WHO, to work towards achieving a reliable directory of medical schools in EMR as this will assist in the future health planning in this and other Regions.

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