

# Demand and supply of doctors and dentists in Bahrain, 1998–2005

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## العرض والطلب من الأطباء وأطباء الأسنان في البحرين، 1998–2005

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**خلاصة:** قمنا بفحص العرض والطلب من الأطباء البشريين وأطباء الأسنان في البحرين. وحسبنا المطلوب من الأطباء وأطباء الأسنان بهدف توفير طبيب لكل 650 وطبيب أسنان لكل 5000 من السكان. وأظهر تحليل الأيدي العاملة في الوقت الراهن، وأعداد الخريجين المتوقعة خلال الفترة 1998–2005 أن الإمداد من الأطباء وأطباء الأسنان البحرينيين حتى سنة 2005 لن يكفي للوفاء بالطلب المتوقع من هاتين الفئتين. فحتى سنة 2005 سوف يوفر الأطباء وأطباء الأسنان البحرينيون 82.5% و 75.9% من الأعداد المطلوبة منهم على التوالي. وسوف يتوجب توفير النسب المتبقية وهي 17.2% من الأطباء و 24.1% من أطباء الأسنان من الخارج. وهكذا فإن احتمالات زيادة الأعداد المتاحة من هاتين الفئتين من أبناء البحرين عن العدد اللازم حتى سنة 2005 أمر مستبعد جداً.

**ABSTRACT** We examined the supply and demand of medical doctors and dentists in Bahrain. Demand for physicians and dentists was based on the objective of having a physician-to-population ratio of 1:650, and a dentist-to-population ratio of 1:5000. Analysis of the current workforce and projected graduates in the period 1998–2005 indicated that the supply of Bahraini medical doctors and dentists until the year 2005 will not be sufficient to meet the projected demand in these categories. By the year 2005, Bahraini doctors and dentists will provide 82.5% and 75.9% of medical and dental demands respectively. The remaining 17.2% of physicians and 24.1% of dentists will have to be recruited from abroad. Thus, the prospect of oversupply of Bahrainis among these categories until the year 2005 is highly unlikely.

### L'offre et la demande de médecins et de dentistes à Bahreïn, 1998-2005

**RESUME** Nous avons examiné l'offre et la demande de médecins et de dentistes à Bahreïn. La demande de médecins et de dentistes était fondée sur l'objectif visant à avoir un médecin pour 650 habitants et un dentiste pour 5000 habitants. L'analyse de la population active actuelle et des projections relatives aux diplômés pour la période 1998-2005 a montré que l'offre de médecins et de dentistes bahreïnites jusqu'à l'an 2005 ne suffira pas à répondre à la demande projetée dans ces catégories. D'ici à l'an 2005, les médecins et dentistes bahreïnites couvriront 82,5% et 75,9% des besoins en médecins et dentistes respectivement. Le complément soit, 17,2% de médecins et 23,1% de dentistes devra être recruté à l'étranger. La perspective d'effectifs excessifs de Bahreïnites dans ces catégories jusqu'à l'an 2005 est donc très improbable.

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## Introduction

The provision of human resources in adequate quantity and with appropriate competence to provide health care services is critical to health planning in any country. Health manpower development requires long-term planning which may extend to 10 years and more. "Hospitals can be built in months, it takes a decade to train a doctor" [1]. This investment in human resources should not be taken lightly. In Bahrain, up to 70% of the entire Ministry of Health budget is allocated to personnel. It is therefore necessary for the health system to have a long-term plan for human resources development to meet the demand for services in the future. The plan should also include a periodic review of the need for personnel in light of emerging variables such as projected population and economic growth.

Until the mid-1980s, health care organizations within the public sector in the country operated in a relatively stable environment. This is no longer the case. The context in which we now must function is characterized by rapid and widespread change, brought about by local, regional and international economic, technological and sociocultural pressures [2]. All organizations must attempt to anticipate the consequences of this turbulence and to plan effectively for the wise use of the resources available. In such an environment, health organizations must use business planning as a management tool. For example, in the National Health Services in the United Kingdom (UK), various subunits must produce business plans that resemble the operation of commercial enterprises [3]. One key element of such plans is the careful tabulation of human resources needs. In Bahrain, the development of the workforce is considered to be essential to supporting the future of health care [4].

In the Ministry of Health, the Directorate of Training has been charged with ensuring the development of an adequate number of properly trained professionals, para-professionals and support personnel to meet the needs of the existing and future health services [5]. Since 1992, the Directorate has conducted a regular assessment of training needs to ensure that human resources development is targeted in such a way as to guarantee adequate numbers and types of properly trained staff to carry out the organizational mission.

We examined the issue of the development of adequate numbers of Bahraini medical doctors and dentists for employment in the health services of Bahrain. It has to be emphasized that many other properly trained professional, para-professionals and support staff will be required if the health services of the country are to become world class. However, our study focused on doctors and dentists because of two major factors. First, medical and dental staff are among the most expensive personnel to be developed, primarily because of the nature and length of their training involved. Second, the Ministry of Health has been facing some difficulties in creating positions in the public sector for a number of graduates of medical and dental schools. This has prompted the question: is there an oversupply of physicians and dentists and, consequently, a possibility of unemployment in these categories of manpower?

## Materials and methods

All human resources development plans must begin with a clear understanding of the present situation: how many of each category of staff are currently employed? What is the basis for estimating the future

need of each category? What are the variables that may affect such estimates?

In 1997, the Bahrain Health Information Directorate collected data about medical and dental doctors in the country, including place of work, nationality and specialty. The information has been used as a basis to assess the present situation. Furthermore, Bahrain's planning objectives towards the year 2000 and beyond set specific targets for health services. The plan emphasizes the need to maintain the health gains for the people of Bahrain, and suggests a ratio of one physician for every 650 inhabitants and one dentist for every 5000 individuals as acceptable and achievable ratios. Consequently, the number of physicians and dentists is based on population projections to the year 2005, which are derived from the 1991 census data with an exponential average annual growth rate of 1.9% applied [6]. The required number of physicians and dentists is further refined by applying a 1% rate of attrition to compensate for retirement. The estimated numbers of new physicians and dentists to the year 2005 are based on data from the Ministry of Education, 1997 [7].

## Results

### Medical doctors

Table 1 shows the number of doctors in Bahrain in 1997. There were 924 medical doctors; of these, 611 (66.1%) were Bahrainis. The Ministry of Health employs 604 (65.4%), the Bahrain Defence Force Hospital employs 171 (18.5%) and the remainder were employed in the private sector. Of the Bahraini medical doctors that year, 432 (70.7%) were working at various facilities of the Ministry of Health, and another 64 (10.5%) were undergoing their internship training. Furthermore, 172 (28.5%) non-Bahraini doctors were working at various facilities of the Ministry of Health in 1997.

Table 2 projects the need for doctors in Bahrain until the year 2005. This projection is based on an average population growth rate of 1.9% per annum, and the number of physicians required in order to maintain a ratio of one physician for every 650 population. The table also shows the expected number of Bahraini doctors in service from 1998 until the year 2005, the estimated loss due to attrition, the number of new doctors

Table 1 Bahraini and non-Bahraini medical doctors in Bahrain, 1997

Organization	Bahraini		Non-Bahraini		Total	
	No.	%	No.	%	No.	%
Ministry of Health						
Physicians on active service	368	68.1	172	31.9	540	58.4
Physicians in training	64	100	0	0	64	6.9
Bahrain Defence Force Hospital	126	73.7	45	26.3	171	18.4
International Hospital	0	0	32	100	32	3.5
American Mission Hospital	1	4.2	23	95.8	24	2.6
Awali Hospital	0	0	11	100	11	1.2
Private clinics	45	73.8	16	26.2	61	6.1
Others	7	33.3	14	66.7	21	2.3
Total	611	66.1	313	33.9	924	100

Table 2 Demand for doctors in Bahrain, 1998–2005

Year	Estimated population (× 1000)	Doctors needed	Bahraini doctors in service	Loss to attrition	Expected new graduates <sup>a</sup>	Adjusted Bahraini workforce	Disparity	
							No.	%
1998	599	921	611	6	69	674	247	26.8
1999	610	938	674	7	28	695	243	25.9
2000	622	957	681	7	29	717	240	25.1
2001	634	975	707	7	69	779	196	20.1
2002	646	994	734	7	44	815	179	18.0
2003	658	1012	755	8	37	841	171	16.9
2004	671	1032	775	8	23	856	176	17.1
2005	684	1052	787	8	23 <sup>b</sup>	870	182	17.2

<sup>a</sup>After satisfying the 1-year compulsory internship

<sup>b</sup>Estimated figure

expected, and the cumulative number of Bahraini physicians (adjusted workforce). The disparity between the number required and the number available (columns 3 and 7 of Table 2) is shown in column 8, which indicates the number and percentage of medical staff needed to achieve the target ratio. This figure represents the projected demand for non-Bahraini doctors to the year 2005. There were 313 (33.9%) non-Bahraini physicians in service in the country in 1997. Our analysis projects that the demand for non-Bahraini physicians in the workforce will be reduced to an estimated 17.2% of the physicians' workforce by the year 2005.

### Dentists

Table 3 shows that there were 77 dentists practising in Bahrain in 1997, of which 80.5% were Bahrainis. A total of 39 dentists (50.6%) were working at Ministry of Health facilities, 37 (95%) of whom were Bahraini. The dentist to population ratio in the country in 1997 was 1:7500. Table 4 illustrates the projected demand for dentists

to the year 2005, based on the desired dentist to population ratio of 1:5000. The table shows that the country needed 120 dentists in 1998 and that number will increase to 137 by the year 2005. There were 62 Bahraini dentists in 1998. This figure is expected to increase to 100 by the year 2005. The disparity between the demand and available Bahraini dentists ranges from 44 (36.7%) in 1998 to 33 (24.1%) in 2005. This disparity represents the expected demand for non-Bahraini dentists.

### Discussion

The objective of human resources planning is to ensure that there is the right number of personnel with the appropriate skills available when and where they are needed. Bahrain's health plan suggests a ratio of one physician per 650, and one dentist per 5000 population. These ratios are achievable and will assist the country's drive towards sustaining health gains for its people. As a reference, the UK has a physician per population ratio of 1:667, while Italy has

Table 3 Bahraini and non-Bahraini dentists in Bahrain, 1997

Organization	Bahraini		Non-Bahraini		Total	
	No.	%	No.	%	No.	%
Ministry of Health						
Salmaniya Medical Complex	3	100	0	0	3	3.9
Health centres	32	94.1	2	5.9	34	44.2
Others	2	100	0	0	2	2.6
Bahrain Defence Force Hospital	0	0	0	0	0	0
International Hospital	0	0	4	100	4	5.2
American Mission Hospital	2	40.0	3	60.0	5	6.5
Awali Hospital	0	0	2	100	2	2.6
Private clinics	22	41.7	2	8.3	24	31.2
Gulf Air	1	100	0	0	1	1.3
Public security	0	0	2	100	2	2.6
Total	62	80.5	15	19.5	77	100

Table 4 Need for dentists in Bahrain, 1998-2005

Year	Estimated population (x 1000)	Dentists needed	Bahraini dentists in service	Loss to attrition	Expected new graduates <sup>a</sup>	Adjusted Bahraini workforce	Disparity No.	Disparity %
1998	599	120	62	1	15	76	44	36.7
1999	610	122	76	1	7	82	40	32.8
2000	622	124	82	1	3	84	40	32.3
2001	634	127	84	1	5	88	39	30.7
2002	646	129	88	1	5 <sup>a</sup>	92	37	28.7
2003	658	132	92	1	5 <sup>a</sup>	96	36	27.3
2004	671	134	96	1	5 <sup>a</sup>	100	34	25.4
2005	684	137	100	1	5 <sup>a</sup>	104	33	24.1

<sup>a</sup>Estimated figure

1:588. The dentist per population ratio in the UK is 1:2500; in Sweden it is 1:1000 and in France it is 1:1428 [8]. We have to stress that manpower per population ratio is not the only method available to estimate the needs and demands of the health care

workforce. This rate, nevertheless, has been extensively cited among the health-related indicators [9] and indicators of health profile and human development [10].

Data concerning the medical staff in Bahrain should be carefully analysed in or-

der to properly plan to satisfy the needs of these specialties. Previous reports suggest that there might be a surplus in medical and dental staff, starting in the year 2000. However, it is our belief that the need for medical and dental staff should be differentiated from job availability in the public sector. The demand for physicians and dentists should be based on the collective health care services provided by the public and private sectors. The use of physician-per-population and dentist-per-population ratios represents useful proxy indicators of the demand on medical and dental staff.

Data in Table 2 indicate that the country will continue to have a deficit of medical doctors, which has to be compensated by recruiting non-Bahraini physicians. This deficit ranges from 247 physicians in 1998 to 182 in 2005, representing 26.8% and 17.2% respectively of the total number of medical doctors required to satisfy the ratio of 1:650. In-depth analysis of the data indicates that at least 60 new Bahraini physicians will be needed annually in order to maintain a ratio of one Bahraini physician per 650 population. There are approximately 302 Bahrainis in various levels of undergraduate medical studies in Bahrain and other universities worldwide who are expected to graduate between 1998 and 2005. These prospective physicians, considering zero rate of attrition among them, are expected to join the workforce once they complete their training. They represent an average of 38 physicians every year during the period 1998–2005. Since the number of expected graduates falls short of the required level, we can assume that by the year 2005, Bahrain will have a deficit of 182 doctors, which can be compensated by recruiting non-Bahraini physicians.

Another important concept that has been carefully reviewed is the non-Bahraini contract staff, whom we viewed as

temporary staff until Bahraini physicians and dentists become available. Our analyses indicate that non-Bahraini medical doctors and dentists will be needed beyond the year 2005 to cover the disparity between the number of graduating Bahraini physicians and dentists and the demand for such services. According to our estimate, which considers zero attrition among Bahraini students in medical and dental schools, the demand for non-Bahraini physicians will have dropped from 26.8% in 1998 to 17.2% in 2005, while the demand for non-Bahraini dentists will have dropped from 36.7% to 24.1% during the same period. However, in order to eliminate the demand on non-Bahraini medical and dental doctors, it is estimated that Bahrain will need an estimated 60 physicians and 10 dentists per annum during the period 1998–2005, nearly double the annual current supply of Bahraini physicians and dentists.

We are aware that new health care services are either being implemented or planned in response to the population growth and pressure for more services. Salmaniya Medical Complex, for example, has undergone recent expansion that will increase its inpatient capability from 727 beds to over 1000 beds before the year 2000. This will require more physicians to run the new services. Both the Bahrain Defence Force Hospital and the Health Centres Directorate are expected to expand, and therefore will need more physicians and dentists. Meanwhile, the private sector plans to build two hospitals, along with dental clinics that will exert additional demand for medical and dental personnel.

## Conclusions

It is highly unlikely that a surplus of Bahraini medical and dental doctors will occur

to the year 2005. Our analyses indicate that the supply of Bahraini doctors and dentists will not be sufficient to maintain a ratio of one physician per 650 population and one dentist per 5000 population. Furthermore, it is estimated that the average number of new Bahraini physicians and dentists required to maintain such ratios is bridging the gap between supply and demand, but will not close it by the year 2005. In order

to satisfy the target ratios, 17.2% and 24.1% of the required workforce of physicians and dentists respectively will have to be filled by non-Bahrainis.

Our study emphasizes the importance of continuous monitoring of human resources plans and programmes. Without looking to the future, the health services in Bahrain may not be prepared to meet the challenges that lie ahead.

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