
Workforce needs of Health Professionals in Kuwait

Part III - Pharmacists

ABSTRACT

Background: Pharmacists contribute to reducing the cost of health care while at the same time improving patients' use of medications and health outcomes. Pharmacists play an important role in counseling patients, and reducing medication errors.

Objectives: The aims of the study were to:

1. describe the size of the workforce of pharmacists during the years 2000 to 2005;
2. project the future demand of pharmacists, with special reference to the supply of Kuwaiti pharmacists during the years 2006 to 2020.

Methods: Local and international data on demand and supply of pharmacists were retrieved. Data on actual population and supply of pharmacists during the years 2000 to 2005 were used to project the future demand of pharmacists during the period 2006 to 2020. Population projections were derived using an exponential average annual population growth rate. The future need for pharmacists was projected using the average pharmacists: population ratio during 2000 to 2005, of one pharmacist to 1,613 population (equivalent to 0.6231 pharmacist: 1000 population). The projected number of Kuwaiti pharmacists at a given year was calculated by incrementing the number of Kuwaiti pharmacists of the previous

year by 9.44%, the average annual growth rate of Kuwaiti pharmacists during 2000 to 2005. Projections for the demand of pharmacists were also computed based on the UK ratio of 0.5891 pharmacist: 1000 population (equivalent to one pharmacist to 1698 population).

Results: The average annual growth rate of 9.44% for Kuwaiti pharmacists indicates that the number of Kuwaiti pharmacists is increasing. However, there is a gap between the numbers of Kuwaiti and non-Kuwaiti pharmacists. Of the total demand of pharmacists in year 2005, Kuwaiti pharmacists constituted 18.4%, mostly employed by the Ministry of Health. Disparity between the number of Kuwaiti pharmacists available and total demand for pharmacists is expected to become wider if the health authorities were to improve the pharmacist: population ratio to the values that exist in industrialized countries such as UK.

Conclusion: It is unlikely that the supply of Kuwaiti pharmacists will meet the projected demand until the year 2020. To minimize the gap between the total demand and the supply of Kuwaiti pharmacists, it is desirable that the Faculty of Pharmacy, Kuwait University consider increasing the annual intake of students, and the Ministry of Higher Education increase the number of scholarships offered for pharmacy education.

INTRODUCTION

Imbalance in the health workforce is a major challenge for health policy-makers, since human resources are the most important component of any health care delivery system.¹⁻³ Health policies can have an impact on health workforce imbalance. Economic, sociodemographic, political, geographical and cultural factors contribute directly or indirectly to shaping and transforming the entire society and hence the health workforce.⁴ The numerous factors involved in the health workforce imbalance call for a coherent health workforce policy.

Forecasting the future number of health personnel needed and developing policies to meet such figures are essential to any health care system.⁵⁻⁶ In terms of financial resources, human resources account for a high proportion of national budgets assigned to the health sector.⁷⁻⁹

The supply and demand of pharmacists are influenced by the evolving role of the pharmacist in the health care system. In Canada, government support for professional development of pharmacists was much more limited than that for physicians and nurses. There were relatively few government initiatives to recruit and retain pharmacists.

There was a reported trend of pharmacists being drawn to private community pharmacies and away from hospitals by higher pay.¹⁰

Pharmacists represent the third largest health professional group in the U.S. with about 196,000 pharmacists in 2000. Pharmacists are the health professionals specifically trained in dispensing prescription medications and providing a growing number and range of pharmaceutical care services that are critical to high quality health care and medication use. Most pharmacists practice in community pharmacies or drug stores, hospitals and medical centers. Smaller numbers of pharmacists are employed by pharmaceutical manufacturers and consulting groups. Recently, there has been a shortage in the number of pharmacists in the US as a result of factors such as market growth, extended pharmacy hours, increased number of women pharmacists with their shorter work patterns, expansion in pharmacists' roles, and increased insurance coverage for prescription drugs.

Consequences of the shortage in US pharmacists led to a negative impact upon the profession and the public resulting in job stress, reduced time for pharmacists to provide patient counseling, and reduced professional satisfaction due to longer working hours and lesser flexibility in scheduling, and introducing fatigue-related factors that increase the potential for medication error.

Technology advances, market changes, and other professional opportunities have contributed to a dynamic employment market for pharmacists within the last few years. The growth in demand for pharmacists in hospital settings is largely due to the increased complexity of medication therapy and the need for proper drug selection, dosing, monitoring and management of the entire drug use process to assure quality and cost-conscious use patterns.

Pharmacists can contribute to reducing the cost of health care while at the same time improving patients' use of medications and health outcomes. As with many professions,

pharmacy has seen increasing numbers of women enter the profession over the last three decades. The tendency of women pharmacists to elect part-time work and to work fewer hours than their male counterparts has become a critical issue.

Recently there have been a growing need for the expanded clinical practice role for pharmacists, including more collaboration with clinicians, and in counseling individual patients about medication use. The role of pharmacists is wider than simply filling and dispensing prescription medications.

In the US the majority (over 60%) of the nation's pharmacists are employed in the private community pharmacy sector, and about 29% are employed in institutional settings, principally hospitals. The education of pharmacists has been changing to extend the educational requirements to a doctorate level entry degree, requiring additional clinical training and expanded practice skills, thus preparing pharmacists to take on more complex clinical roles such as counseling patients, advising other health professionals on drug use issues, and participating in disease management programs. Related to this, in the US there has been a nationwide conversion from the Bachelor of Science in pharmacy to the Doctor of Pharmacy (PharmD) degree—a change that has lengthened the education program and increased the amount of practice experience. This conversion, which is now almost complete, has required additional faculty and other resources within schools of pharmacy and has reduced the number of graduates during the transition period.¹¹

In Kuwait, the private health sector was the main employer for pharmacists (57.9%), while the Ministry of Health employed the remaining 42.1% during 2005. In the private sector, 8.4% of pharmacists were Kuwaitis, while 32.2% of pharmacists working in the Ministry of Health were Kuwaitis. Overall, Kuwaiti pharmacists constituted only 18.4% of the pharmacists workforce in Kuwait in year 2005.

Pharmacists-to-population ratios have been used as indicators for the local health

care needs and for comparison with the situation in various countries when planning the demand for pharmacists.¹²⁻¹⁴ Since its establishment under the umbrella of the Health Sciences Center in February 1996, the Faculty of Pharmacy of Kuwait University is continuing its curriculum development and staff recruitment with a target of 35 academic staff in four departments. The Faculty accepted its first class of 35 students in September 1997. The number of students admitted increased over the past 7 years to reach 50 in 2005. The first batch graduated in June 2002.¹⁵

OBJECTIVES

1. Describe the size of the workforce of pharmacists in Kuwait during the years 2000 to 2005.
2. Project the future demand of pharmacists in Kuwait, with special reference to the supply of Kuwaiti pharmacists during the years 2006 to 2020.

METHODS

Local and international data on demand and supply of pharmacists were retrieved. Local sources included Department of Statistics and Medical Records, Ministry of Health¹⁴, Department of Medical Licensing for Private Sector, Ministry of Planning, Public Authority for Civil Information (PACI). International sources included World Health Organization¹², and the Pharmacy Workforce Standing Advisory Committees of UK¹⁶, USA¹¹, and Canada.¹⁰

Data on population and supply of pharmacists for the years 2000 to 2005 were used to assess the size of pharmacists' workforce, and project the number of pharmacists needed for the years 2006 to 2020. Naturally, projecting over such a long interval bears elements of uncertainty since both supply and demand depend on future unforeseen trends in a number of areas, many of which are unpredictable. Considerable changes are expected to happen in the health care delivery system of Kuwait in the future. Changes in health care policies or in medical education strategies can grossly

affect demand and supply of pharmacists as well as the other categories of health professionals.

Population projections of the years 2006 to 2020 were based on the population of the year 2005 using an exponential average annual population growth rate.

The number of pharmacists needed at any year was estimated by dividing the estimated population at that year by 1,613, population to one pharmacist ratio which is equivalent to 0.6231: the average number of pharmacists per 1000 population for the period of 2000 to 2005, (Tables 1 and 2).

The projected number of Kuwaiti pharmacists at a given year was calculated by incrementing the number of Kuwaiti pharmacists of the previous year by 9.44%, the average annual growth rate of Kuwaiti pharmacists during the years 2000 to 2005 (see page 35. Appendix, Table 3). The disparity between the projected number of pharmacists needed and the number available was calculated together with their percentages for each year.

Similar projections for the demand of pharmacists were also computed based on the United Kingdom ratio of 0.5891 pharmacist per 1000 population (equivalent to one pharmacist to 1698 population).

RESULTS

Table 1 depicts the population and supply of Kuwaiti and non-Kuwaiti pharmacists during the period 2000 to 2005. The table also shows the pharmacist to 1000 population ratios which were calculated by dividing the number of pharmacists in service by the respective population size, and then multiplying the result by 1000. The average pharmacist to 1000 population ratio per annum for the period 2000 to 2005 was 0.6231 (equivalent to one pharmacist to 1,613 population). The average annual growth rate for Kuwaiti pharmacists was 9.44% compared to 8.26% for non-Kuwaitis. Figure 1 illustrates the actual and projected supply of pharmacists until year 2020. It is clear that there is a gap between the numbers of Kuwaiti and non-Kuwaiti

pharmacists, and is likely to continue until 2020.

Table 2 presents the pharmacist to 1000 population ratios, and the population to one pharmacist ratios in various countries. The pharmacist to 1000 population ratio in Kuwait (0.5744) is comparable to the UK ratio (0.5891), while it is higher than the ratios in all Gulf countries except Qatar.

Table 3 shows the projected number of pharmacists needed during the years 2006 to 2020. The projected total demand of pharmacists will increase from 1,623 in year 2006 to 2,124 in 2020, while the projected number of Kuwaiti pharmacists will increase from 298 in 2006 to 1,072 in 2020 based on an annual growth rate of 9.4%. It is estimated that the disparity between the projected number of pharmacists needed and the projected number of Kuwaiti pharmacists available will decrease from 81.64% in 2006 to 50.47% in 2020 (Table 3 and Figure 2).

Table 4 shows the projected number of pharmacists needed based on the pharmacist: population ratio of UK (0.5891), which is equivalent to one pharmacist to 1698 population. Accordingly, the number of pharmacists needed is projected to be 1542 in year 2006 and would reach 2018 in 2020,

Table 1. Actual supply of pharmacists in Kuwait, 2000 – 2005

Year	Total population	Actual number of pharmacists in service			Pharmacists to 1000 population ratio
		K	NK	Total	
2000	2,189,668	118	607	725	0.3311
2001	2,274,980	117	777	894	0.3930
2002	2,363,325	166	795	961	0.4066
2003	2,484,334	203	893	1096	0.4412
2004	2,522,451	243	908	1151	0.4563
2005	2,569,516	272	1204	1476	0.5744

K= Kuwaiti, NK= Non-Kuwaiti

Sources:

- Department of Medical Licensing, Ministry of Health. (for private sector data)
- Third Quarterly Report (July–September 2005), Department of Statistics & Medical Records, Health & Vital Statistics Division, Ministry of Health. (for year 2005 data)
- Fourth Quarterly Report (October–December 2004), Department of Statistics & Medical Records, Health & Vital Statistics Division, Ministry of Health. (for year 2004 data)
- Health Kuwait Editions 40, 39, 38, 37, Department of Statistics & Medical Records, Health & Vital Statistics Division, Ministry of Health (for years 2000 to 2003).

while the projected number of Kuwaiti pharmacists will be 298 in year 2006 and would reach 1,052 in 2020. The disparity between total demand and the supply of Kuwaiti pharmacists will decrease from 80.67% in 2006 to 47.87% in 2020 (Figure 3).

DISCUSSION/CONCLUSIONS

This study was carried out with the objective of examining the supply and demand of pharmacists in Kuwait. The demand was based on the ratio of one pharmacist to 1,613 population (equivalent to 0.6231 pharmacist per 1000 population:

Table 2. Pharmacist to 1000 population ratio and population to one pharmacist ratio in various countries

Country	Pharmacist: 1000 population	Population: one pharmacist	Year of publication
Gulf Countries			
Kuwait	0.5744	1,741	2005
Saudi Arabia	0.2374	4,212	2001
United Arab Emirates	0.3772	2,651	2001
Bahrain	0.2171	4,406	2001
Qatar	0.8958	1,116	2001
Oman	0.2210	4,525	2001
Middle East Countries			
Egypt	0.6800	1,471	2000
Syrian Arab Republic	0.5223	1,915	2001
Jordan	0.9599	1,042	2001
Iran	0.1249	8,006	1998
European Countries			
Sweden	0.6004	1,666	2000
Switzerland	0.6204	1,612	2000
Denmark	0.4929	2,029	2002
Netherlands	0.1969	5,079	2001
Belgium	1.4469	691	1998
France	1.0135	987	2001
Germany	0.5791	1,727	2001
Italy	1.0954	913	2001
Russian Federation	0.0705	14,184	2001
United Kingdom	0.5891	1,698	1993
Japan	1.7119	584	2000
Australia	0.7212	1,387	2001
Canada	0.7968	1,255	2000
United States	0.6881	1,453	2000

Sources:

- WHO, <http://globalatlas.who.int/GlobalAtlas/DataQuery>
- Third Quarterly Report (July–September 2005), Department of Statistics & Medical Records, Health & Vital Statistics Division, Ministry of Health (for Kuwait, 2005).

Figure 1. Growth in pharmacist supply in Kuwait, 2000-2020

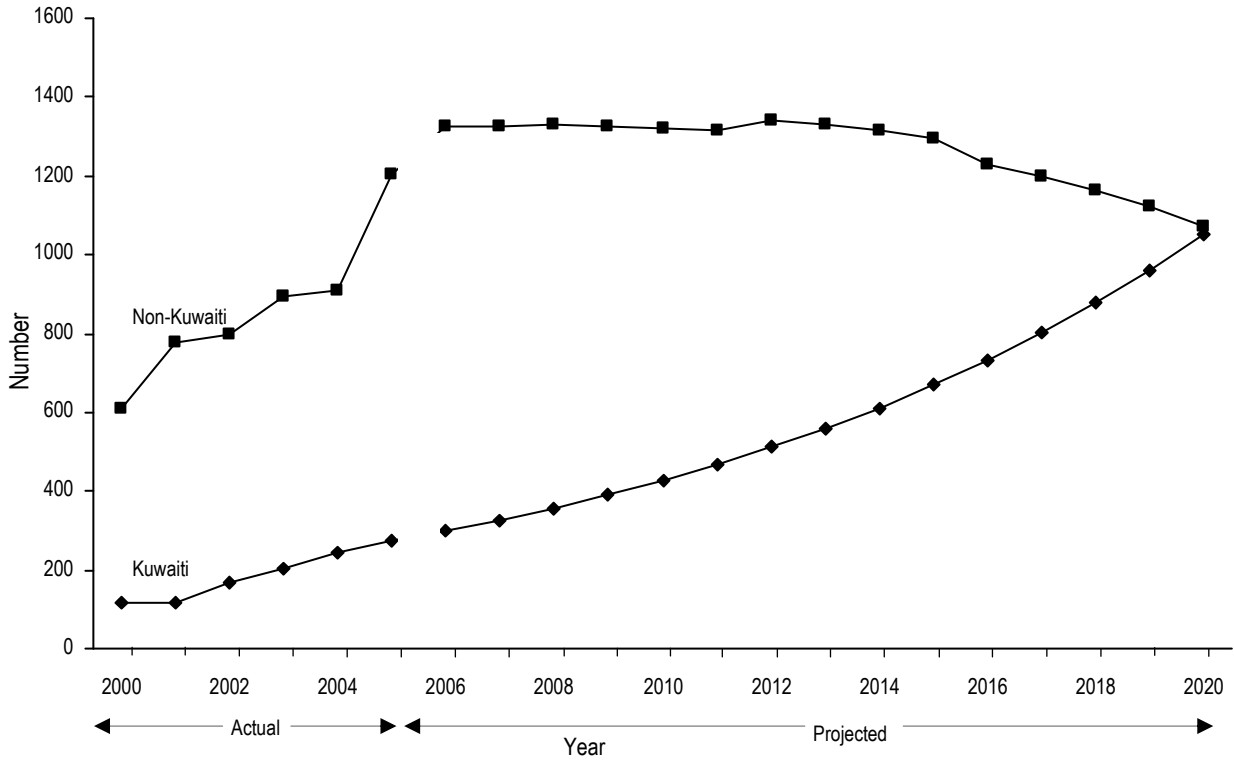


Figure 2. Actual and projected demand and supply of Kuwaiti pharmacists in Kuwait, 2000-2020

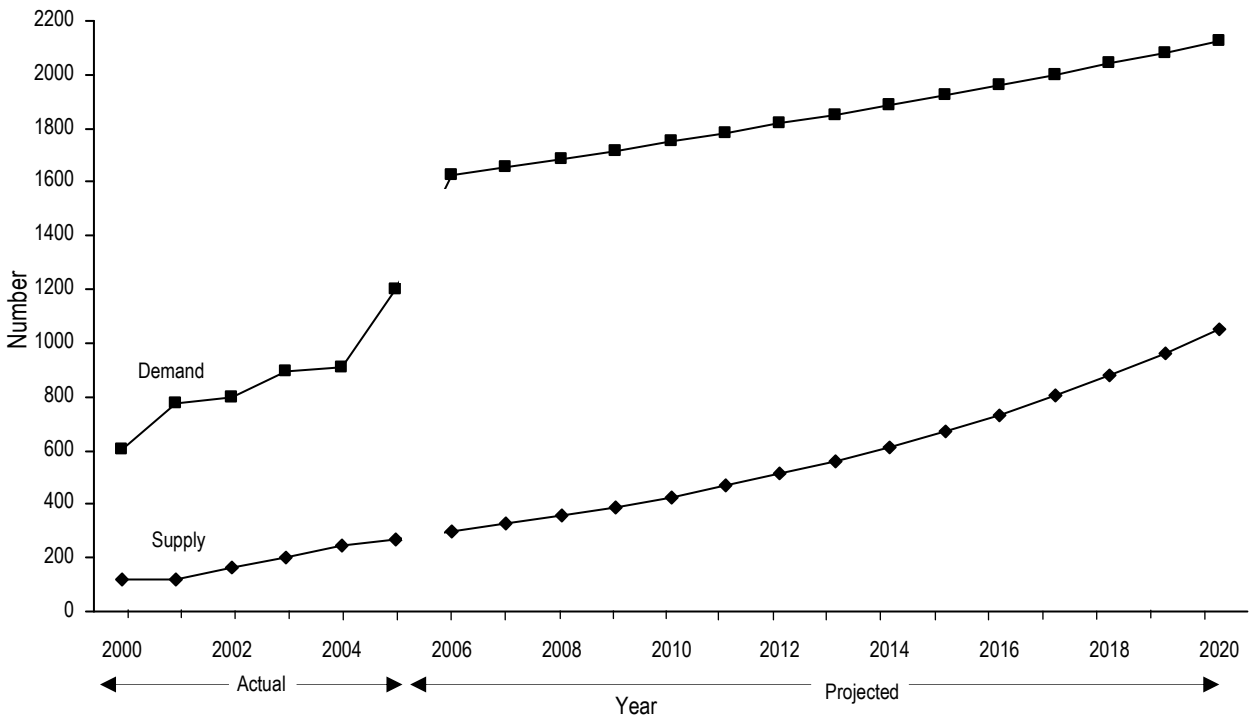


Table 3. Projected number of pharmacists needed in Kuwait for the years 2006-2020

Year	Estimated total population ¹	Projected number of pharmacists needed ²	Projected number of Kuwaiti pharmacists ³	Disparity between total demand and Kuwaiti pharmacists ⁴	
				Number	%
2006	2,617,685	1623	298	1325	81.64
2007	2,666,986	1653	326	1327	80.28
2008	2,717,450	1685	356	1329	78.87
2009	2,769,109	1717	390	1327	77.29
2010	2,821,997	1750	427	1323	75.60
2011	2,876,145	1783	467	1316	73.81
2012	2,931,591	1817	511	1342	72.42
2013	2,988,369	1853	560	1329	70.35
2014	3,046,515	1889	612	1314	68.22
2015	3,106,069	1926	670	1293	65.87
2016	3,167,069	1963	733	1230	62.66
2017	3,229,555	2002	803	1199	59.89
2018	3,293,567	2042	878	1164	57.00
2019	3,359,150	2083	961	1122	53.86
2020	3,426,347	2124	1052	1072	50.47

^{1,2,3,4} Refer to appendix (page 35) for the formula used in calculation

the average ratio for the years 2000 to 2005).

Analysis of the current pharmacist workforce and projected numbers during the period 2006 to 2020 shows that the supply of Kuwaiti pharmacists until the year 2020 will not be sufficient to meet the projected demand. By the year 2020, Kuwaiti pharmacists are expected to provide 49.53% of the projected pharmacist demand. If the pharmacist: population ratio were to be improved to the level in UK (one pharmacist per 1698 population) the deficit between the demand for pharmacists and the supply of Kuwaiti pharmacists will reach 47.87% by 2020.

Considerable changes in the health care delivery system in Kuwait have occurred, and are likely to continue. Planning on a long-term basis is difficult on account of many uncertainties. While we regard our

Table 4. Projected number of pharmacists needed in Kuwait based on the United Kingdom pharmacists: population ratio, for the years 2006-2020

Year	Estimated total population ¹	Projected number of pharmacists needed ²	Projected number of Kuwaiti pharmacists ³	Disparity between total demand and Kuwaiti pharmacists ⁴	
				Number	%
2006	2,617,685	1542	298	1244	80.67
2007	2,666,986	1571	326	1245	79.25
2008	2,717,450	1600	356	1244	77.75
2009	2,769,109	1631	390	1241	76.09
2010	2,821,997	1662	427	1235	74.31
2011	2,876,145	1694	467	1227	72.43
2012	2,931,591	1726	511	1215	70.39
2013	2,988,369	1760	560	1200	68.18
2014	3,046,515	1794	612	1182	65.89
2015	3,106,069	1829	670	1159	63.37
2016	3,167,069	1865	733	1132	60.70
2017	3,229,555	1902	803	1099	57.78
2018	3,293,567	1940	878	1062	54.74
2019	3,359,150	1978	961	1017	51.42
2020	3,426,347	2018	1052	966	47.87

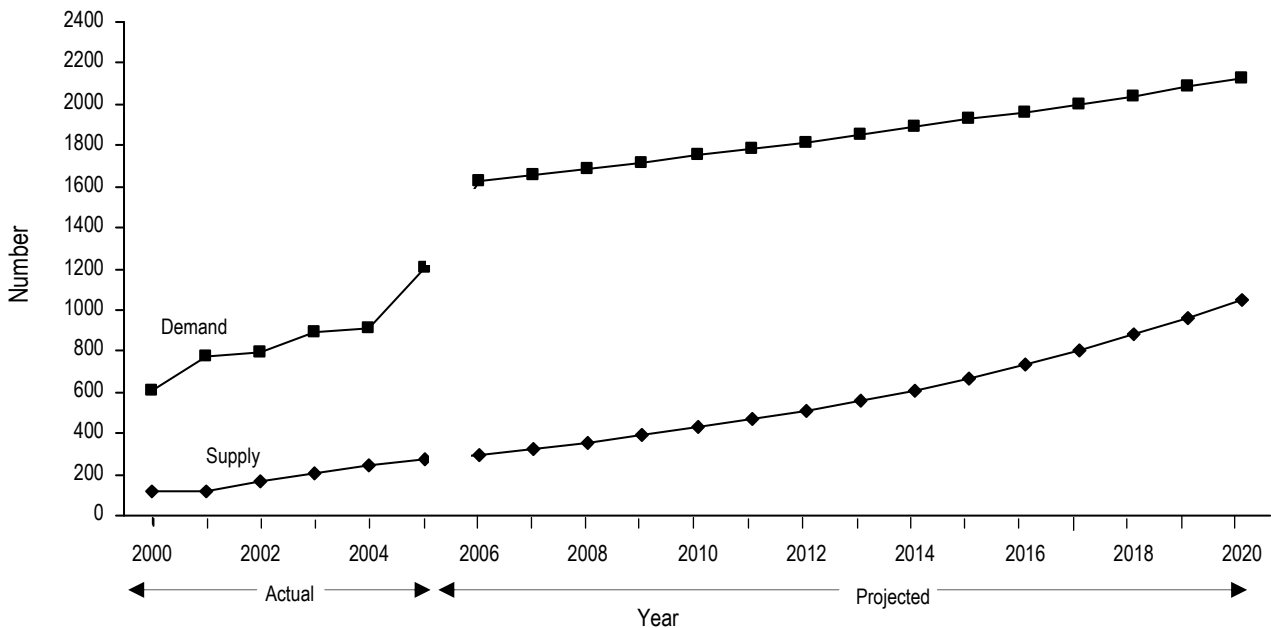
^{1,2,3,4} Refer to appendix (page 35) for the formula used in calculation

assumptions as plausible in the present context, we realize that it is important to keep the interactions between the health policy environment and the factors which influence the supply and demand for pharmacists under review, taking into account the Government's current initiatives in relation to the health care delivery system of the country. It is unlikely that the gap between the demand for pharmacists and the supply of Kuwaiti pharmacists will be bridged by year 2020, and the discrepancy is expected to continue.

RECOMMENDATIONS

The current workforce of pharmacists in Kuwait is made up of a minority of Kuwaiti pharmacists (18.4%) most of whom (73.5%) are employed by the Ministry of Health, while the majority are expatriate pharmacists (Table 1, year 2005). The rate

Figure 3. Actual and projected demand and supply of Kuwaiti pharmacists in Kuwait based on the United Kingdom pharmacists: population ratio, 2000-2020



of increase in supply of Kuwaiti pharmacists has been almost constant throughout the years 2000 to 2005, ranging from 13.1% to 18.4%. Our analysis suggests that the gap between the demand for pharmacists and the supply of Kuwaiti pharmacists will decrease, although slowly, and some measures need to be taken to expedite this process. The Kuwaiti pharmacists share should be increased through an increase in pharmacy student intake, taking into account the ability of the education system to manage the expansion while maintaining quality.

Given the changes that the health authorities and the pharmacy education system are likely to face during the coming decades, and the uncertainties inherent in looking this far ahead, our recommendations are designed to provide a flexible and cost-effective approach, which can be reappraised in the future as necessary:

- The Pharmacy education authorities may consider increasing the annual intake of pharmacy students without compromising the quality of pharmacy education. These authorities comprise the Faculty of Pharmacy, Kuwait

University for National Education, and the Ministry of Higher Education for extending the number of international pharmacy scholarships.

- Changes in health care policy of the Ministry of Health and other government sectors can substantially affect pharmacists demand and supply. Taking this into account, health authorities need to continuously review health-related policies to achieve balance between pharmacist demand and supply.
- The Ministry of Health and other employers of pharmacists' should give further attention to improve the working conditions and retention via improvement of salaries, benefits and overtime, and reducing workload and non-pharmacy tasks.
- Improve access to internal and external continuing education and professional development programs for pharmacists, and create opportunities for promotion and advancement to build their careers.¹⁷

In pursuing the overall development goals, the authorities need to give

consideration to recent trends in pharmacy education and practice. These include development of the curriculum for pharmacists to include programs leading to Doctor of Pharmacy, in order to enhance contribution of pharmacists to clinical practice. In addition, electronic prescribing using modern information technology may be emphasized.

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Appendix

Table 3

¹Estimated population = [Kuwaiti population in the previous year X 1027.9/1000 for Kuwaitis (growth rate 2.79%)] + [non Kuwaiti population in the previous year X 1008.1/1000 for non Kuwaitis (growth rate 0.804%)], [27.9 = 28.5 (natural increase in Kuwaiti population per 1000 for the year 2004) – 0.6 (the average decrement in natural increase per 1000 in Kuwaiti population for the period of 1994 - 2004), 8.1 = 8.5 (natural increase per 1000 in non Kuwaiti population for the year 2004) – 0.4 (the average decrement in natural increase in non Kuwaiti population for the period of 1994 - 2004), Health Kuwait, 2004.

²Projected total number of pharmacists needed at a year = Estimated population at that year divided by 1613 (population to one pharmacist ratio which is equivalent to 0.6231: the average number of pharmacists per 1000 population for the period of 2000 to 2005).

³Projected number of Kuwaiti pharmacists at a year = Number of Kuwaiti pharmacists in the previous year X 109.44/100 (Average annual growth rate of Kuwaiti pharmacists of the period 2000 to 2005 = 9.44%, calculated as $\{[(272-118) / 272] \times 100^2\} \div 6$).

⁴Disparity number = Projected total number of pharmacists needed (column 2) – Projected number of Kuwaiti pharmacists (column 3). Disparity % = [Disparity number ÷ Projected number of pharmacists needed (column 2)] X 100.

Table 4

^{1,3,4}As described in Table 3.

²Projected number of pharmacists demanded at a year = Estimated population at a year divided by 1698 (population to one pharmacist ratio in UK which is equivalent to 0.5891: the average number of pharmacists per 1000 population in UK, WHO).