The Present and Future Situation of the Medical University Graduates: Needs, Potentials and Realities [1]

Morteza Taghavi,; Behnam Sadeghi,; Kambiz Sharifzadeh,; Fariborz Mortazavi,; Sina Mar'ashi,; Hamid-Reza Dehghan,; Abolghasem Rezvani,; Mehdi Rahmani,; Omid Amoli,; Abbas Haghshenas,.

Introduction

Records indicate that the enrolment of students to Iranian Medical universities increased dramatically in the years 1985 and 1986 and this trend continued until 1993. The first and second intake of medical students admitted during this period have finished their general medical education and many more medical students are now in the process of completing their studies. The growing concern is that these young, newly qualified physicians will soon enter a health care system that is already over staffed.

The provision and promotion of health and "Health For All" is one of the main objectives of the WHO (World Health Organization). It is also one of the major objectives of the Iranian Ministry of Health, Treatment and Medical Education, in the year 2000. To achieve this, the system requires, in common with other sectors, resources such as manpower, material and money.

Issues such as the quality of the medical education system, which has been responsible for the education and training of many talented students in the past seven years, and various existing problems and deficiencies regarding medical equipment and financial resources are of considerable interest, but the aim of this article is to discuss the policy decisions and the measures the Ministry have taken concerning the provision of health personnel required in the fields of health and treatment.

Material and Methods

This article has been compiled using information and data provided by various departments of the Ministry of Health, Treatment and Medical Education and the Central Office of the Military Services. Unfortunately, no reliable sources existed in either of these departments, which could provide us with all the classified information regarding the current status of health network system. As a result, we have had to rely on incomplete data regarding the present and future situation of general practitioners within the system. Keeping this in mind, the contributors to this article have sought to avoid making groundless and

[1] The present study has been carried out in 1994

partial judgements in their calculations and summations.

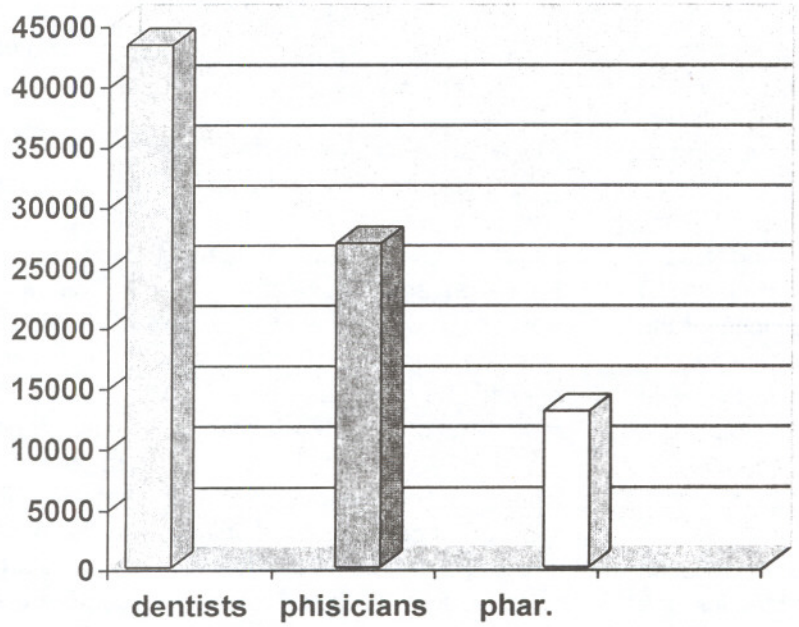
The data

The first step in the assessment of the existing situation, is to determine the current situation of the country regarding the human resources in the health and treatment sector (general practitioners in particular). Figure 1 illustrates the overall situation regarding the number of health personnel in the fields of medicine, dentistry, pharmaceuticals and laboratory sciences throughout the country (1993).

At present, the ratio of physicians to the population is 1:2,233. In other words, there is only one physician offering health and treatment services to every 2,330 individuals.

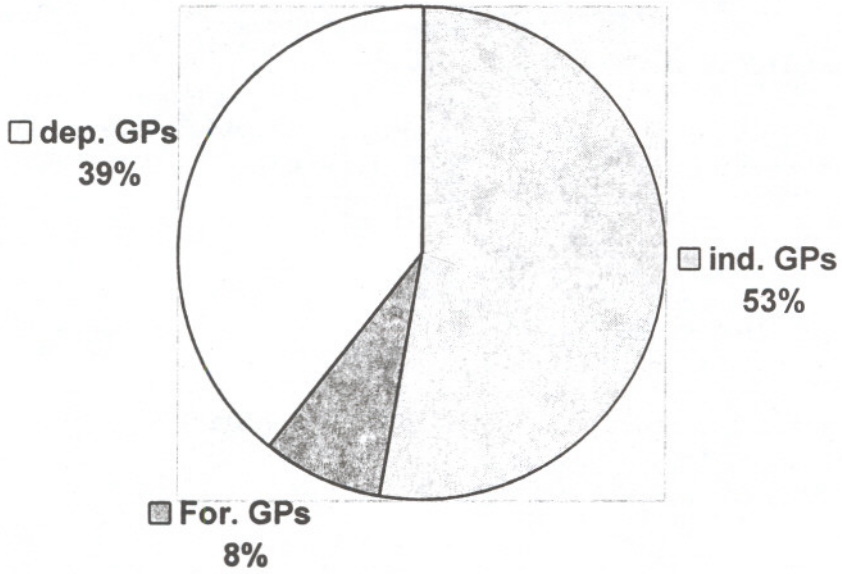
Practising Physicians = 26,869
Population = 60,000,000

Fig 1. number of dentists, phisicians and pharmacologists in Iran in 1993



the rate of population increase, the ratio of

Fig 2. the current situation of the physicians in the country regarding employment and nationality. **('dep' stands for dependent, 'ind' stands for independent and 'for' stands for foreigner)**



In response to the demand for health professionals in the country, the Ministry of Health, Treatment and Medical Education made a concerted effort to educate and train specialists by increasing the intake of medical students at universities.

Table 1 shows the number of medical students admitted between 1986-93. The statistics for Shaheed University of Medical Sciences, the Imam Hossein & the Army Medical Universities are not shown in this table).

The situation as it exists is that within the next few years, all these students will graduate and a considerable number of young physicians will join the medical profession. Table 2 shows the number of students who graduated in general medicine between 1993-99. This information was provided by the Ministry of Health, Treatment and Medical Education (1992).

Considering the number of graduates in 1999 and physicians to the population is 1:1260. In reality, the real ratio is even lower as the graduates of the Shahed University, the Imam Hossein University, the Army University and universities abroad have not been taken into account in these calculations (1991).

Another policy measure implemented by the Ministry of Health, Treatment and Medical Education was to ensure that there was available manpower to meet health needs in deprived regions. The Service Act for physicians and paramedics, passed by the Majlis (Parliament) in 1988, made it mandatory for graduates in general medicine to serve the Ministry of Health, Treatment and Medical Education for a period of 60 months (5 years). The duration of the service in the zones ranges from 3 to 5 years, depending on the zone they serve in (1994). (The 3 years of service zones are referred to as 3/5, the four years of service zones as 4/5, and the five years of service zones as 5/5

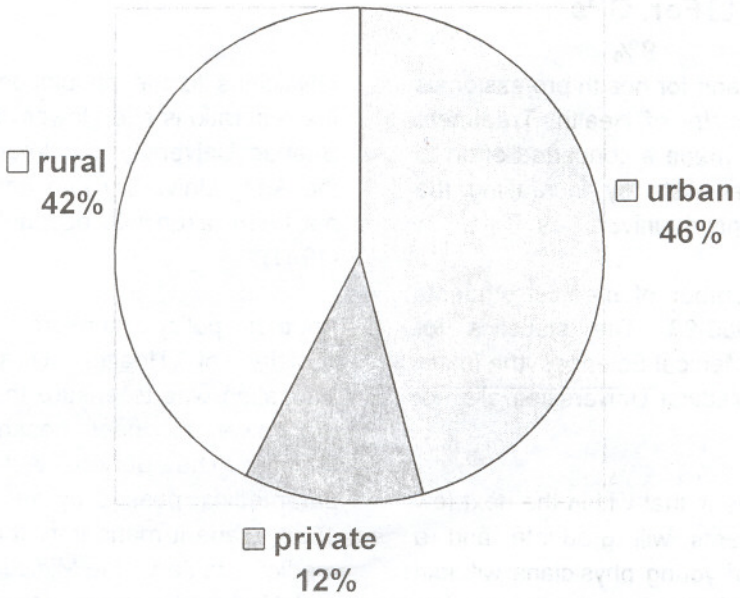
This section is dedicated to the study of the balance between the number of medical graduates and the requirements of the health and treatment networks. There are 1983 rural and 272 urban health centers including public and private sectors (except the armed forces). About 567 of the above are privately owned centers [5,6] (Figure 3).

In total, there are 1983 rural and 2155 urban health centers in the network.

At present, there are 1181 medical graduates in service working in rural health centers and 1647 medical graduates working in urban health centers. Thus, a total number of 2828 medical graduates are employed in the health network system (Figure 3). According to the statistics provided by the Department of Planning and Distribution of Human Resources and Health Messengers, a total of 3016 non-service Iranian physicians are also part of the system (1993).

As mentioned before, according to the statistics of the Statistics Research Department, in November 1992, the number of public rural and urban health centers are estimated to be 1983 and 215 respectively. Besides the medical graduates in service working in urban centers, there are also other general practitioners and specialists employed by insurance companies or other public health organizations. Therefore, in spite of the lack of accurate data regarding the required number of medical graduates in urban centers, a maximum of 215 positions can be predicted which, when added to the 1983 positions in the rural areas (i.e. one medical graduate in service for each rural health center), would add up to a total of 4138 physicians

Figure 3- The number and distribution of health centers according to the statistics of the Statistics Research Department



to fill the system to capacity

According to the statistics of the Department of Planning and Distribution of Human Resources, the network system capacity in the 3/5, 4/5 and 5/5 zones are shown in Table 4. (1993) . As shown in the Table, only 13.9% of the health centers (rural and urban) are situated in the 3/5 zone. 28.4% and 57.7% of the health centers are located in the 4/5 and 5/5 zones respectively.

After the brief study of the status of the health network and the number of general practitioners employed by this system, we describe the situation of medical graduates and their position in the network.

As shown in Figure 4, if the laws are enforced properly and physicians are employed according to the capacity and needs of each region, the following results could be expected:

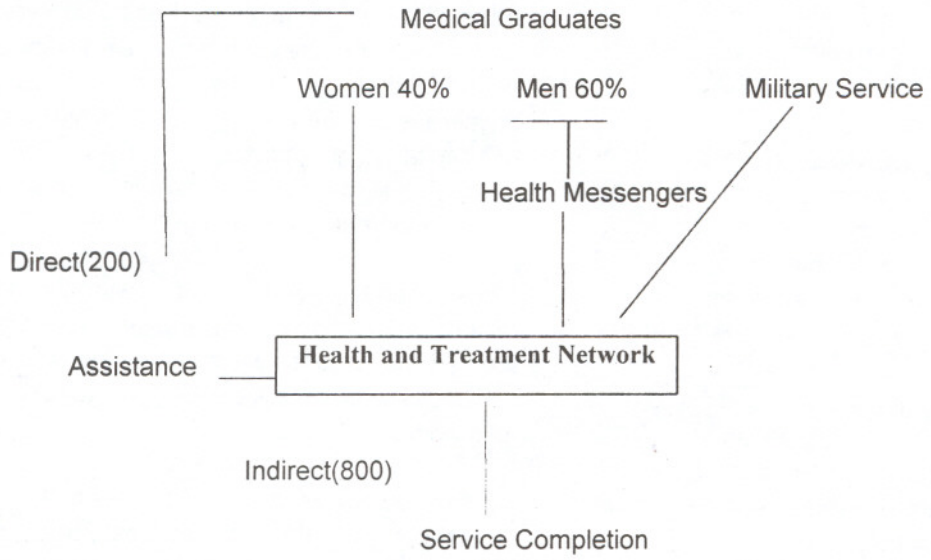


Figure 4

1. The number of female graduates entering the network each year is about 40% of the total number of graduates according to the predictions made by the Education Department of the Ministry. In addition, 50% of the male graduates enter the network as Health Messengers (30% of the total of graduates). The physicians who have completed their military service also enter this network. Medical graduates from universities abroad have not been accounted for).

2. The number of graduates leaving the network each year are as follows:

-In the 3/5 zone, about 1.3 times the number of staff employed the same year + 111 graduates accepted as indirect assistants.

-In the 4/5 zone, about 1.4 times the number of staff employed the same year + 227 graduates accepted as indirect assistants.

-In the 5/5 zone, about 1.5 times the number of staff employed the same year + 462 graduates accepted as indirect assistants.

3. Every year 30 graduates leave the network as direct assistants.

In order to predict the status of the Health and Treatment Network in the country with regard to Figure 4, the input and output in future years has been estimated in Tables 5, 6 and 7. An annual increase of 5% of the network capacity has been calculated in these Tables, to further develop and expand health institutes. The graduates of universities abroad who will finally return to the country have not been taken into account. The number of employed physicians includes medical graduates and health messengers and does not include non-Iranian and state-employed physicians.

CONCLUSION

As shown in Table 8, every year there are 2000-3000 recently graduated general practitioners who exceed the present need within the health network of the country. Thus, many health centers will employ more physicians than they need, resulting in a waste of capital and human resources in this sector.

As mentioned before, the graduates of the Shaheed University, the Imam Hossein University, the Army University and universities abroad have not been taken into account in these calculations. In addition, due to the confusion caused by the announcement of the results of the University Entrance Exam in 1986, the number of students admitted at universities seem to be more than what the statistics show.

With regard to the analysis of the available data, the contributors to this article call the attention of the Ministry of Health, Treatment and Medical Education to the following issues:

1. As a result of the policy to increase student admission, there is now an oversupply of medical graduates, who now exceed the capacity of the health system to absorb them. It would seem more reasonable to reduce the admission rate of medical student to universities, establish a standard through which the admission procedure can take place according to the future requirements of the country and the abilities of the health network to provide sufficient financial resources, man power and equipment.

2.To establish a reasonable balance between the input and the output of present and future medical graduates of universities in the network, we suggest that the period of the mentioned Service be reasonably reduced and determined on the basis of the number of graduates each year (the statistics of which are available). On the other hand, the real capacity of health centers (rural, urban, health messengers, etc.) should be determined in order to prevent the overload of physicians in different regions, avoiding the waste of capital and human resources. Through a calculated long-term planning there would be less pressure on future medical graduates.

Considering the above, and following the reduction of student admission and easing the educational load of universities, we suggest that the existing abilities and capabilities be put to use in the following:

A. The quality of the medical education system needs to be raised in order to create the necessary abilities in students, which is a basic principle in the education of skilled man power.

B. A planned and structured program needs to be set up to preserve and update the knowledge of medical graduates practising in related fields.

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years	65-66	66-67	67-68	68-69	69-70	70-71	71-72
to STATE UNIVERSITIES	4520	3875	4230	3170	3512	3795	3380
AZAD UNIVERSITIES	959	1124	961	464	467	595	598
TOTAL	5479	4999	5191	3634	3979	4390	3978

Table 2

years	93	94	95	96	97	98	99
GRADUATEs of STATE UNIVERSITIES	4300	3700	4000	3000	3400	3600	3200
GRADUATEs of AZAD UNIVERSITIES	900	1000	900	450	450	550	550
TOTAL	5200	4700	4900	3450	3850	4150	3750

Table 3

EMPLOYED NON-SERVICE PHYSICIAN (RECRUITED)	EMPLOYED PHYSICIAN IN SERVICE	EMPLOYED IRANIAN GPs
3016	2828	5824

Table 4

PROVINCE	5/5	4/5	3/5	RURAL CENTERS
TEHRAN	261	8	--	77
MARKAZI	90	34	--	72
GILAN	188	--	15	91
MAZANDARAN	309	16	--	147
EASTERN AZERBAIJAN	184	94	--	122
WESTERN AZERBAIJAN	78	66	33	103
BAKHTARAN	51	39	27	54
KHUZISTAN	32	83	61	70
FARS	136	118	23	170
KERMAN	80	87	10	114
KHORASAN	201	82	44	144
ISFAHAN	283	47	14	133
SISTAN & BALUCHISTAN	--	59	68	78
KURDISTAN	--	83	28	55
BUSHEHR	--	18	60	35
HORMOZGAN	--	115	7	79
LURESTAN	59	56	1	54
ILAM	--	--	61	33
HAMADAN	58	58	20	76
CHAHARMAHAL BAKHTIARI	47	24	21	59
YAZD	74	19	--	42
KOHKILUYE BOYER-AHMAD	--	--	57	38
SEMNAN	55	4	1	26
ZANJAN	100	16	--	73
TOTAL PERCENTAGE	2286 57.7%	1126 28.4%	551 13.9%	1945
AVERAGE TURN-OVER OF GPs IN SERVICE	$\frac{(13.9) \times 3 + (28.4) \times 4 + (57.6) \times 5}{100} = 4.43$			

Table 5: Estimation of the turn-over of GPs in Service in the health network of the country in the 3/5 zone (13.9% of the network's total capacity). (Network output = graduated residents + GPs finishing their obligatory service. Workforce added to the system = Network Input - Network Output.)

	Network Capacity	Employees in the Network	Network Input	Network Output	Work Force Added to the Network	Employed - Capacity = Overload
1993	575 (5%)	393	546	111 + 131 = 242	546 added 242 left 304 remained	697 employed - 604 capacity 93 overload
1994	604	697 (393+304)	498	111 + 232 = 343	498 added 343 left 155 remained	852 employed - 634 capacity 218 overload
1995	634	852 (697+155)	652	111 + 284 = 395	652 added 395 left 257 remained	1109 employed - 666 capacity 443 overload
1996	616	1109 (852+257)	404	111 + 293 = 404	404 added 404 left 0 remained	1109 employed - 699 capacity 410 overload
1997	699	1109 (1109+0)	456	111 + 293 = 404	456 added - 404 left 52 remained	1161 employed - 734 capacity 427 overload
1998	734	1161 (1109+52)	434	111 + 311 = 422	434 added 422 left 12	1173 employed - 771 capacity = 402
1999	771	1173 (1161+12)	411	111 + 315 = 426	411 added 426 left 15 remained	1158 employed - 810 capacity 348 overload

Table 6: Estimation of the turn-over of GPs in Service in the health network of the country in the 4/5 zone (28.4% of the network's total capacity). (Network output = graduated residents + GPs finishing their obligatory service. Workforce added to the system = Network Input - Network Output.)

	Network Capacity	Employees in the Network	Network Input	Network Output	Work Force Added to the Network	Employed - Capacity = Overload
1993	1175 (5%)	803	1116	227 + 201 = 428	1116 - 428 = 688	1491 - 1234 = 257
1994	1234 (5%)	1491 (803+688)	1017	227 + 373 = 600	1017 - 600 = 417	1908 - 1295 = 613
1995	1295	1908 (1491+417)	1332	227 + 477 = 704	1332 - 704 = 628	2536 - 1360 = 1176
1996	1460	2536 (1908+628)	826	227 + 508 = 735	826 - 735 = 91	2627 - 1468 = 1199
1997	1498	2627 (2536+91)	932	227 + 530 = 757	932 - 757 = 175	2802 - 1500 = 1302
1998	1500	2802 (2627+175)	886	227 + 574 = 801	886 - 801 = 85	2887 - 1575 = 1312
1999	1575	2887 (2802+85)	840	227 + 595 = 822	840 - 822 = 18	2905 - 1654 = 1251

Table 7: Estimation of the turn-over of GPs in Service in the health network of the country in the 5/5 zone (57.5% of the network's total capacity) (Network output = graduated residents + GPs finishing their obligatory service. Workforce added to the system = Network Input - Network Output.)

year	Network Capacity	Employees in the Network	Network Input	Network Output	Work Force Added to the Network	Employed - Capacity = Overload
1993	2381(5%)	1632	2268	462 + 326 =788	2268 - 788 = 1480	3117 - 2507 = 605
1994	2507	3112 (1632+1480)	2065	462 + 622 = 1084	2065 - 1084 = 981	4093 - 2633 = 1460
1995	2634	4093 (3112+981)	2706	462 + 818 =1280	2706 - 1280 = 1426	5516 - 2764 = 2752
1996	2764	5519 (4093+1426)	1680	462 + 889 =1351	1680 - 1351 = 479	5848 - 2903 = 2945
1997	2903	5848 (5519+329)	1892	462 + 954 = 1416	1892 - 1416 = 476	6321 - 3048 = 3273
1998	3048	6324 (5848+476)	1800	462+1050= 1512	1800 - 1512 = 288	6612 - 3200 = 3412
1999	3200	6612 (6324+288)	1708	462+1107= 1569	1708 - 1569 = 139	6751 - 3360 = 3391

Table 8: Estimation of the turn-over of GPs in Service in the health network of the country (Overall Result) (Network output = graduated residents + GPs finishing their obligatory service. Workforce added to the system = Network Input - Network Output.)

	Network Capacity	Employees in the Network	Network Input	Network Output	Work Force Added to the Network	Employed - Capacity = Overload
1993	4138 (5%)	2828	1960+1470 +500 =3930	800 + 658 = 1458	3930 - 1458 = 2472	5300 - 4345 = 955
1994	4138+207 4345	5300 (2828+2472)	1760+1320 +500=3580	800 + 1227 = 2027	3580 - 2027 = 1553	6853 - 4562 = 2291
1995	4345+217 4562	6853 (5300+1553)	1840+1380 +1470=4690	800 + 1306 = 2106	4690 - 2106 = 2584	9437 - 4790 = 4647
1996	4562+228 4790	9437 (6853+2584)	1380+1045 +1220= 3735	800 + 1690 = 2490	3735 - 2490 = 1245	10682 - 5030 = 5652
1997	4790+240 5030	10682 (9437+1245)	1540+1155 +1380=4075	800 + 1777 = 2577	4075 - 2577 = 1498	12180 - 5282 = 6898
1998	5030+252 5282	12180(10682 +1498)	1660+1245 +1035= 3940	800 + 1935 = 2735	3940 - 2735 = 1205	13385 - 5546 = 7839
1999	5282+264 5546	13385 (12180 +1205)	1500+1125 +1155= 3780	800 + 2017 = 2817	3780 - 2817 = 963	14348 - 5823 = 8525