

## Trends in Medical Specialty Choice Among Israeli Medical Graduates, 1980–1995

Shmuel Reis MD<sup>1</sup>, Margalit Goldfracht MD<sup>1</sup>, Ada Tamir DSc<sup>2</sup>, Riki Van Raalte MA<sup>1</sup>, Tomas Spenser FRCGP<sup>1</sup> and Doron Hermoni MD<sup>1</sup>

<sup>1</sup> Department of Family Medicine, Clalit Health Services – Haifa and Western Galilee District and Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

<sup>2</sup> Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

**Key words:** medical specialty choice, women in medicine, generalist career choice, medical education in Israel, medical personnel planning

### Abstract

**Background:** Which medical specialties do Israeli medical graduates choose? Answers to this question can serve as an essential means of evaluating both Israeli medical education and the healthcare system.

**Objectives:** To determine the distribution of medical specialty choice, its change over time and the possible influence of the medical school on the choice; to study the graduates' gender, gender variability in specialty choice and time trends in both; and to assess the choice of family medicine as a career among the graduates as a group, by medical school, gender, and time trends.

**Methods:** The study population comprised all graduates of the four medical schools in Israel during 16 years: 1980–1995 inclusive. Data were obtained from the four medical schools, the Israel Medical Association's Scientific Council, and the Ministry of Health. Data allowed for correct identification of two-thirds of the graduates.

**Results:** A total of 4,578 physicians graduated during this period. There was a significant growth trend in the proportion of women graduates from 22.6% in 1980 (lowest: 20.0% in 1981) to 35.3 in 1995 (highest: 41.5% in 1991). Overall, 3,063 physicians (66.8%) started residency and 1,714 (37.4%) became specialists. The four most popular residencies were internal medicine, pediatrics, obstetrics and gynecology, and family medicine. Ten percent of Israeli graduates choose family medicine.

**Conclusions:** The overall class size in Israel was stable at a time of considerable population change. Women's place in Israeli medicine is undergoing significant change. Family medicine is one of the four most popular residencies. A monitoring system for MSC in Israel is imperative.

*IMAJ 2001;3:973–977*

Medical specialty choice is an issue for many. Policymakers perceive MSC as part of medical workforce planning, educators view it as an outcome of their efforts, and academics strive to build an MSC theory [1–4]. In a fascinating article [1], Allen

MSC = medical specialty choice

states: "There are clear signs that the role of the medical profession as the main force in determining the medical career structure will come under increasing pressure if senior members of the profession fail to recognize the need for fundamental changes in the system of training, supporting and maximizing the talents of all its members." This statement underscores the relevance of MSC data and analysis not only for policy makers, educators and academics but also for the future and independence of the medical profession at large.

In the last decade, due to the negative impact of geographic and professional specialty maldistribution on healthcare quality and equity, the MSC issue has become an important determinant of the health status of individuals, communities and nations [5–7]. The relationship between specialty distribution and the performance of a healthcare system is now largely accepted. Starfield [7] pioneered the documentation of primary care impact as a determinant of a nation's health status. In some countries (the United States in particular), primary care career enhancement is a national goal and a means to address the noxious effects of specialty maldistribution [5–9].

Other MSC aspects such as future attrition, gender [10–12], medical school experience and more [1,13] are referred to in the literature with increasing frequency. Surprisingly, Israel has only sparse data on MSC [14]. For a country that not only has one of the world's highest per capita physician ratios [15], but in addition has been experiencing a healthcare crisis for at least a decade, one might have expected a close scrutiny of the MSC issue – however this is not the case [14]. The potential relationship between this crisis and specialty maldistribution, dominance of hospital-based specialties and overproduction of manpower (which generates costs with, at best, marginal contribution to the nation's health) have been examined only on a small scale [14,15]. We have embarked on the present study with this perspective in mind. Our aim was to collect data on the MSC of medical school graduates in Israel in order to inform the various interested parties, as well as the professional and public debate.

### Study scope

Our study aimed to identify the trends in specialization choices among the graduates of the four medical schools in Israel

during the 16 years between 1980 and 1995. The main research objectives were:

- to paint an overall picture of medical graduates during their study years
- to determine the distribution of specialty choice among Israeli medical school graduates (as a whole and by school of graduation)
- to describe the changes over time in the distribution of specialties by comparing 1980–87 to 1988–95
- to describe the graduates' gender, gender variability in specialty choice, and time trends in both
- to discuss the choice of family medicine as a career among the graduates as a group by medical school, gender, and time trends.

## Methods

### Study population

The study population comprised all the graduates of the four faculties of medicine (Hebrew University-Hadassah in Jerusalem, Sackler Faculty of Medicine in Tel Aviv, Rappoport Faculty of Medicine at the Technion in Haifa, and Faculty of Health Sciences at Ben-Gurion University in Beer Sheva) during 16 years, 1980–1995 inclusive. Specialty training in Israel takes from 4 to 6 years, with some overlap. Thus, graduates of the 1995 class were well into their postgraduate training and some were already at the specialist level at the time of data collection (1997–99).

### Data collection

Data were collected from three sources: a) the four medical schools, which provided a complete computerized list of their 1980–95 graduates, including names, identity numbers and graduation dates; b) the Israel Medical Association's Scientific Council, which supplied us with a computerized list of registered residents (in most specialties) who graduated in Israel, listing also the specialty and starting date of specialization; and c) the Ministry of Health, which provided a complete computerized list of all specialists registered with the Ministry of Health who graduated from Israeli medical schools, with the date of their specialist status.

The files from these three sources were combined into one master file and matched by name and identity number. As a result of inaccurate recordings of names and identity numbers in the files from all sources, only about two-thirds of the graduates could be matched. The names and identity numbers were then deleted from the master file according to privacy protection regulations, and the analysis was performed anonymously.

### Data analysis

The data were processed by SPSS. Relationships between categorical values were calculated using the chi-square test. The time

trends data were aggregated into two equal periods, 1980–87 and 1988–95 respectively, for ease and clarity of presentation.

## Results

### Graduates' characteristics

#### • Numbers and changes over time in the four medical schools [Table 1]

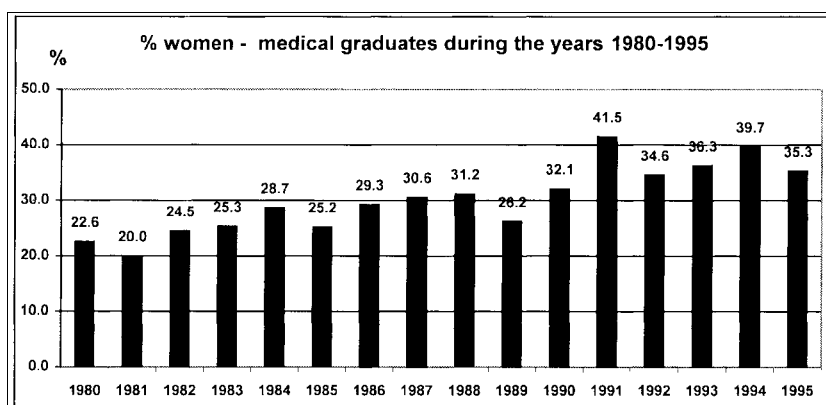
A total of 4,578 physicians graduated from Israeli medical schools during the years 1980–1995. There was no significant change in the overall number of graduates during this period. The balance between the schools changed significantly over time: the number of Haifa medical school graduates grew by 18% in the second time period (1988–95), and the proportion of those in the total class in the Jerusalem and Tel Aviv medical schools diminished by about 8% each. In each year during the 1980–1995 time period, about 300 physicians graduated from the four medical schools.

#### • Gender and time trends [Figure 1]

Of the 4,578 graduates 3,193 (69.7%) were men. During the 1980–87 period 1,718 men (74.2%) and 598 women (25.8%) graduated, compared to 1,475 (65.2%) and 787 (34.8%) respectively during the 1988–95 period. There was a significant growth in the proportion of women graduates ( $P < 0.00001$ ). When comparing the two time periods, while men still make up the majority of medical school graduates in Israel (at least up to 1995), their absolute number (and percentage) has diminished considerably as the class sizes did not change. An examination of the individual years is even more striking [Figure 1], with an

**Table 1.** All graduates from 1980 to 1995, by medical schools and 8 year periods

Period	Jerusalem	Tel Aviv	Haifa	Beer Sheva	Total
1980–87	735 31.7%	905 39%	380 16.4%	296 12.8%	2,316
1988–95	621 27.5%	776 34.3%	546 24.1%	319 14.1%	2,262
<b>Total</b>	1,356 29.6%	1,681 36.7%	926 20.2%	615 13.4%	4,578
<b>% change</b>	<b>-8</b>	<b>-8</b>	<b>+18</b>	<b>+4</b>	<b>-1</b>



**Figure 1.** Percentage of women medical graduates, 1980–95

increase from 20% in 1981 to 41.4% in 1991. There was also a significant increase in the number of women graduates during the years 1980–95 ( $P<0.0001$ ) in each of the medical schools.

### Choice of residency

#### • Numbers [Table 2, two left-hand columns]

A total of 3,063 physicians (66.8% of the graduates) started residency; 37.4% of the graduates (1,714) became specialists, and 29.5% were still in residency (in 1998). There were no significant differences in these parameters across the four medical schools. No data confirming start of residency could be identified for 33.1% of the graduates. This number includes:

- approximately 10% of residents specializing in areas selected by a relatively small number of graduates during the years 1988–95 for whom data were incomplete
- physicians whose names and identity numbers were inaccurate and therefore could not be matched
- physicians who had not registered for any specialization, including graduates who go directly to the army after medical school and have to delay starting their residency training (*atuda* in Hebrew)
- physicians who had left the country or the profession, or had died.

**Table 2.** Top 10 specialties according to popularity and gender (specialists only)

Specialty	% of graduates	No. of graduates	% of women graduates	No. of women graduates
Internal medicine (without sub-specialty)	18.3	314	.204	64
Pediatrics	16.6	285	32.3	92
Obstetrics and gynecology	11.6	199	14.6	29
Family medicine	11.1	190	44.2	84
Ophthalmology	5.3	90	.356	32
Psychiatry	4.7	81	34.6	28
General surgery	4.5	77	6.5	5
Cardiology	3.9	66	6.1	4
Orthopedics	2.7	47	2.1	1
Otolaryngology	2.3	40	15.0	6
<b>Total</b>	<b>*81.0</b>	<b>1389</b>	<b>24.8</b>	<b>345</b>

\* The Israel Medical Association Scientific Council recognizes 76 medical specialties. Of all the specialists, 81% chose 10 of these 76 specialties.

**Table 3.** Number and percentage of graduates choosing family medicine during the years 1980–95, by medical school and time period (specialists and residents)

Medical school	No. of graduates	% of graduates	1980–1987 %	1988–1995 %	Change %
Jerusalem	82	8.9	9.5	7.3	-23.2
Tel Aviv	120	10.8	9.9	12.1	+22.2
Haifa	62	9.5	9.0	10.0	+11.1
Beer Sheva	49	13.7	16.0	8.7	-45.6
<b>Total</b>	<b>313</b>	<b>10.2</b>	<b>10.5</b>	<b>9.9</b>	<b>-5.7</b>

There was no significant difference between the genders regarding data on the start or completion of residency. There were no significant differences over time in the popularity of the top four specialties during the years 1980–95 (ranking and proportions for graduates are shown in Table 2). This item was examined both for graduates only [Table 2] and for graduates and actual residents combined (not presented) at the time of data collection. No differences were detected in ranking for the top four specialties, and only small differences in proportions were noted (no more than 1.3%). The popularity of anesthesiology and radiology increased among the residents as compared to cardiology and otolaryngology for the same time period (1988–95).

#### • Specialty choice and gender [Table 2, two right-hand columns]

Among the 1,714 specialists identified, 449 (26.2%) were women. Among the top 10 specialties, women were most represented in family medicine (44.2%), ophthalmology (35.6%), psychiatry (34.6%) and pediatrics (32.3%). The percentage of women was highest in the following specialties: child and adolescent psychiatry 73.9% (n=17), radiology 64.9% (n=24) and pathology 60% (n=6); and lowest in orthopedics 2.1% (n=1), cardiology 6.1% (n=4), general surgery 6.5% (n=13) and obstetrics and gynecology 14.6% (n=58).

#### • Possible influence of medical school on MSC

Certain specialties were chosen by a significantly higher percentage ( $P<0.003$ ) of graduates of the four medical schools: oncology in Jerusalem, ophthalmology and psychiatry in Tel Aviv, and pediatrics in Haifa.

#### • Family medicine as medical specialty choice [Table 3]

About 10% of Israeli graduates choose family medicine as their career. This percentage differs slightly among the four medical schools. Over time, the percentages changed more drastically, with a decline of 45.6% in Beer Sheva and 23.2% in Jerusalem in the second time period as compared to the first. In contrast, increases were noted in Haifa and Tel Aviv [Table 3].

## Discussion

Considerable academic attention has been devoted to physicians' choice of specialty [1–4,13,16–18]. The theories used to describe this construct have different models and predisposing factors [1–3,13,16,19]. There is no consensus regarding the best way to inform the different constituencies in need of MSC data. The result is a heterogeneous mixture of definitions, instruments, data collection methods, conflicting time frameworks, and non-triangulated research methodologies. Despite an apparent consensus on the factors, there is debate concerning their relevance and interaction, with differing opinions concerning the magnitude of prediction and the ensuing theoretical significance [2].

Judging from the number of citations, interest in career choice is growing exponentially. The major

contributors stem from the United States and Britain. Major concerns in both countries over the last decade have been the decline in general practice as a choice in the UK [1,17] and the wish to increase the number of graduates choosing primary care careers in the U.S. [20,21].

In Israel, some scholarly attention has been devoted to the issue [14,15,21,22] and can be summed up as follows: Israel has four medical schools producing about 300 graduates per year [14]. Many of the physicians are immigrants and many more study medicine abroad (an average of 150 a year in 1990) [14]. Very little has been done to curtail the oversupply of doctors, other than recent stricter rules with regard to licensing foreign medical graduates. The number of available specialty positions is largely unplanned. In certain specialties, Israel has an absolute number of specialists of the same magnitude as western countries that are 5 to 10 times its size. One Israeli medical school (Beer Sheva) has proclaimed primary care specialty choice as its mission.

In Israel, as in other countries, medical personnel-planning problems are "chronic and recurring." Yet, while estimates of supply and demand are consistently inaccurate in other countries, in Israel they do not seem to exist at all. Similar to other countries, this results in wide swings in MSC job opportunities. In addition, no serious informed action is taken to mitigate the negative influences of a "free" market in personnel planning.

The following conclusions can be drawn from our data:

- The stability of overall class size in Israel over a period of dramatic population changes (absorption of one million immigrants between 1989 and 1999 along with an aging population) raises questions about the magnitude of planning behind medical personnel production in Israel [14,21]. (The aforementioned immigrants comprised a large proportion of physicians, which doubled the number of medically licensed individuals during this time period – the flip side of the same phenomenon).
- Women's place in Israeli medicine is undergoing a dramatic change, with their proportion in the student and graduate ranks approaching 50% [18]. The implications are similar to those cited in the literature, particularly the need for flexible training and job arrangements [10–12,18,23], which are largely available in Israel. Furthermore, this trend can be used to "humanize" education and care and enhance the primary care choice of medical graduates. This will inevitably lead to the presence of women in specialties in which they were hardly represented (surgery, rheumatology) and will bring into focus the lack of women in academic and research tracks. It has already begun to influence the male dominant ethos of ignoring personal and family health and needs while doctoring, and increasing demands for more humane work conditions for junior (and senior?) doctors. In a similar study, Lambert et al. [24] traced the doctors who qualified in the UK from 1974 to 1993, and found a 27% rise in the proportion of women entering a career in medicine by 1983 and 47% a decade later. Furthermore, they found a marked rise in the

age that these female doctors had children compared with their predecessors.

- No striking changes seem to have occurred in internal medicine, pediatrics, and obstetrics and gynecology as the three most popular residencies [14]. The "new" phenomenon is that of family medicine becoming well established among the leading four. A former report [14] cites the proportion of graduates choosing family medicine from 1980 to 1984 as 7%. This trend should be regarded as a positive sign in the direction of the Israeli healthcare system. Some data are available on the composition of primary care physicians (with or without specialty status) in Israel [21,22]. It seems that the proportion of graduates of specialty training is steadily increasing, but it has not yet reached 50%. It is unknown how many graduates of the three leading specialties go into primary care. Since there is currently no specific instruction in primary care, it is possible that clinical methods appropriate for hospital practice will be introduced into primary care – with its negative consequences [14].
- Ten percent of Israeli graduates are choosing family medicine as their career path. Beer Sheva, with its policy of primary care medicine as priority, produced the largest proportion of family medicine graduates in the first time period, but with a steadily declining trend. During the second 8 year period, Tel Aviv and Haifa produced the largest proportion.. Friedberg and Glick [25] examined the primary care MSC of six classes of Beer Sheva graduates and found the following: only three-quarters of them had made their choice by study time; significant differences existed between those who chose a primary care career and those who did not, yet there was no difference in their perception of the medical school's impact on their choice (while the Beer Sheva mission statement aimed to encourage primary care MSC). Only 26% of respondents identified themselves as primary care aspirants (not limited to family medicine), which prompted the authors to title their paper: "Choosing a career in primary care: the road not taken." The 45.6% decline in choice of family medicine in the second time period is probably a reflection of the same observation. If consistent with 1996–2001 data, it might imply a serious deviation from Beer Sheva's stated mission to provide the Israeli healthcare system with primary care physicians especially through the family medicine residency tract.

The present study has obvious limitations. Data collection could account for only two-thirds of the graduates, and there was no way of judging whether the missing third was similar to our sample. Data quality was surprisingly problematic and further marred the ability to draw firmer conclusions. Despite these limitations, this study – the first of its scope in Israel to the best of our knowledge – highlights significant trends in specialty choice in Israel, similar and different to those observed elsewhere. An additional contribution of the study could be in its implications, as listed below:

- Do we not require a reasonable dataset for monitoring MSC in Israel? The UK and U.S. examples are striking.

- Could we – and should we – not do more and better in the area of medical personnel planning? Surely we would like to know if our medical education affects the reality of healthcare.
- Will we acknowledge the importance of the phenomenon of the changing gender of medicine and act upon it?
- Is primary care career choice a national priority? What is its goal and how can it be achieved through planning and monitoring?

The limitations of the study are also grounds for some of these conclusions, such as signaling the need for a better database to support the various aims mentioned above.

In conclusion, we have provided a picture of MSC in Israel, and, through its analysis and limitations, hope to inform and stimulate a debate on its major findings and conclusions likely to have an impact on medical education and the healthcare system in Israel.

**Acknowledgement.** We are indebted to the Ministry of Health, the four medical schools, and the Israel Medical Association's Scientific Council. The study was made possible by the Ministry of Health Chief Scientist grant no: 03995.

## References

1. Allen I. Career preferences of doctors. *Br Med J* 1996;313:2.
2. Barzansky B. Commentary: research on specialty choice: the challenge is in the details. *Educ Health* 2000;13:197–200.
3. Davis WK, Coles C, Bouhuijs PAJ, Dauphinee WD, McAvoy PA, Alexander DA, Coles C, Donaldson M, Hoffstdt BO, Wakeford RE, Warren VJ. Medical career choice: current status of the literature. *Teach Learn Med* 1990;2:130–8.
4. Dohn H. Choices of careers in medicine: some theoretical and methodological issues. *Med Educ* 1996;30:157–60.
5. Bland CJ, Meurer LN, Maldonado G. Determinants of primary care specialty choice: a non-statistical meta-analysis of the literature. *Acad Med* 1995;70:620–41.
6. Rabinowitz H. Recruitment, retention, and follow-up of graduates of a program to increase the number of family physicians in rural and underserved areas. *N Engl J Med* 1993;328:934–9.
7. Starfield B. Primary Care: Balancing Health Needs, Services and Technology. Oxford: Oxford University Press, 1998.
8. Zinn WM, Sullivan AM, Zotov N, Peters AS, Connelly MT, Singer JD, Block SD. The effect of medical education on primary care orientation. *Acad Med* 2001;76:355–65.
9. Senf JH, Campos-Outcalt D, Watkins AJ, Bastacky S, Killian C. A systematic analysis of how medical school characteristics relate to graduates' choices of primary care specialties. *Acad Med* 1997;72:524–33.
10. Heiligers PJM, Hingstman L. Career preferences and the work-family balance in medicine: gender differences among medical specialists. *Soc Sci Med* 2000;50:1235–46.
11. Williams C, Cantillon P. A surgical career? The views of junior women doctors. *Med Educ* 2000;34:602–7.
12. Reed V, Buddeberg-Fischer B. Career obstacles for women in medicine: an overview. *Med Educ* 2001;35:139–47.
13. Allen I. Factors affecting career choices in medicine. *Bailliere's Clin Obstet Gynecol* 1999;13:323–36.
14. Prywes M, Mirvis DM. Israel. In: Sajid AW, McGuire CH, Monroe Veach R, Aziz LR, Gunzburger LK, eds. International Handbook of Medical Education. London: Greenwood Press, 1994:231–48.
15. Anderson GF, Antebi S. A surplus of physicians in Israel: any lessons for the United States and other industrialized countries? *Health Policy* 1990;17:77–86.
16. Parkhouse J, Ellen DJ. Reasons for doctors' career choice and change of choice. *Br Med J* 1988(296):1651–3.
17. Blades DS, Ferguson G, Richardson HC, Redfern N. A study of junior doctors to investigate the factors that influence career decisions. *Br J Gen Pract* 2000;50:483–5.
18. Notzer N, Brown S. Women's status in medicine in Israel – 1995. *Harefuah* 1995;129:449–51 (Hebrew).
19. Griffith CH 3rd, Georgesen JC, Wilson JF. Specialty choices of students who actually have choices: the influence of excellent clinical teachers. *Acad Med* 2000;75:278–82.
20. Xu G, Rattner SL, Veloski JJ, Hojat M, Fields SK, Barzansky B. A national study of the factors influencing men and women physicians' choices of primary care specialties. *Acad Med* 1995;70:398–404.
21. Shemesh A, Pilpel D, Smetannikov E, Dor M. The Primary Care Physician in Israel. Ministry of Health/Ben-Gurion University report. March 2000 (Hebrew).
22. Gross R, Tabenkin H, Greenstein M, Brammli-Greenberg S, Harrison M. Primary care physicians in Israel 1997: characteristics and changes in an era of reform. *Bitachon Soziali* (Social Security) 1999;54:169–90 (Hebrew).
23. Hojat M, Gonnella JS, Xu G. Gender comparisons of young physicians' perceptions of their medical education, professional life, and practice: a follow-up study of Jefferson Medical College graduates. *Acad Med* 1995;70:305–12.
24. Lambert TW, Goldacre MJ, Parkhouse J. Doctors who qualified in the UK between 1974 and 1993: age, gender, nationality, marital status and family formation. *Med Educ* 1998;32:533–7.
25. Friedberg M, Glick SM. Choosing a career in primary care: the road not taken. *Educ Health* 2000;13:187–96.

**Correspondence:** Dr. S. Reis, Dept. of Family Medicine, Hashachaf St., Bat-Galim, Haifa 35013, Israel.  
Phone: (972-4) 851-3057  
Fax: (972-4) 851-3059  
email: Fammed@netvision.net.il

*To go beyond is as wrong as to fall short.*

*Confucius (500 B.C.)*