

מאיירס - ג'זינט - מכון ברזקדייל  
MYERS - JDC - BROOKDALE INSTITUTE  
مایرس - جوینت - معهد بروکدیل



SMOKLER CENTER FOR HEALTH POLICY RESEARCH

## Paramedics – Supply and Demand for Professional Manpower

Nurit Nirel ♦ Rachel Goldwag ♦ Zvi Feigenberg  
David Abadi ♦ Pinchas Halpern

The study was funded with the aid of a research grant from the  
Israel National Institute for Health Services and Health Policy Research



RESEARCH REPORT

RR-493-07



## Related Myers-JDC-Brookdale Institute Publications

Nirel, N.; Rosen, B.; Goldwag, R.; Matzliah, R. 2003. *Trends in the Employment of Medical and Nursing Manpower under the National Health Insurance Law*. RR-414-03 (Hebrew)

Nirel, N.; Shirom, A.; Ismail, S. 2003. *Modes of Employment of Specialist Physicians in Israel: Characteristics and Impact on their Work Life*. RR-418-03 (Hebrew)

Nirel, N. 1999. *The Employment of Immigrant Physicians from the Former Soviet Union in 1998: Summary of Findings from a Follow-up Study*. RR-339-99 (Hebrew)

To order these publications, please contact the Myers-JDC-Brookdale Institute, P.O.B. 3886, Jerusalem 91037, Tel: (02) 6557400, Fax: (02) 5612391, e-mail: [brook@jdc.org.il](mailto:brook@jdc.org.il).

# **Executive Summary**

## **Background and Introduction**

The paramedic profession, which involves saving lives in immediate danger and transferring patients to the hospital, is growing rapidly in Israel for several reasons. (a) The growth of the ambulance system is connected to the growth and aging of the general population, to the rise in the number of cars and, with it, the rise in the number of car accidents, and to the need to be prepared for emergency situations and for treating casualties. (b) The adoption of the American approach, which argues that paramedics perform as well as physicians in the initial intake of patients at the scene. (c) The training of paramedics for military purposes and the opening of academic departments that teach this profession also contribute to the rise in the number of practicing paramedics. This expansion raises the question as to whether there will be a balance between the supply and demand for paramedics in the future. The answer to this question requires information on the current supply and demand for paramedics in the labor market.

## **Study Goals**

1. To examine the supply of paramedics (to describe the current status of supply in the labor force and examine future sources for additional manpower)
2. To examine future sources for additional labor force
3. To examine the characteristics of the profession from the perspective of those working in it
4. To examine the demand for paramedics
5. To compare the supply and demand forecasts and examine the implications this has for labor force planning in this area

## **Study Method**

In order to examine the supply, a telephone survey was conducted between November (2005) and February (2006) using a closed questionnaire, among a sample of graduates of paramedics courses (whether or not they were working in the profession). Of a list of 868 graduates of paramedics courses (excluding conscripted soldiers), 578 people were sampled (about 70% of those in the list). The aim was to interview at least 50% of the study population. Response rate was 88%; in all, 509 people were interviewed (59% of the study population). In order to examine the future sources of additional paramedics, administrative data on the training of paramedics were examined. To examine various scenarios of demand for paramedics, interviews were conducted with key people in the field of emergency medical services (EMS).

## **Key Findings**

The findings reveal that the paramedics constitute a skilled and educated labor force, employed on average approximately ten years in the profession, with an average age of 34. The factors that attract them to the profession are closely related to the nature of the work (helping and rescuing people, the contents of the work, love of the profession, and the interest and variety). This is supported by the fact that dealing with difficult incidents contributes to a great sense of job

satisfaction. For a relatively large proportion of them, job-related stress is caused by having to cope with administrative issues including: lack of administrative support (50%), paperwork (25%), long hours (34%), imbalance between work and family life (33%), and the salary (60%), rather than having to cope with issues connected to the serious nature of the job (3–5%), the responsibility (10%), and difficult incidents (10%).

Many also stated that it was important for the organization to provide a good salary and financial benefits, support from management, and professional promotion to keep them in the profession. There may be a link between these findings and the disparity between the rates of satisfaction with the profession (60%) and satisfaction with working within the organization (22%). Dissatisfaction with the work is closely linked to burnout, a sense of job overload, and reports of poor health. In addition, as expected, the proportion of those intending to change profession is high among paramedics who feel burnt out from work, those who are dissatisfied, and those who were studying for a degree at the time of the survey.

### ***The Supply***

The examination of the labor force supply showed that approximately 1,000 paramedics have completed the courses in Israel and every year approximately 100 more complete courses. Sixty-four percent of all course graduates are employed in the civilian labor market and the rate of leaving the profession is approximately 18% over a five-year period, with no significant difference between years. Newcomers to the profession have a 96% likelihood of remaining in it after one year; 79% after five years and 68% after ten years. With regard to the likelihood of remaining in the profession, the rates differ for men and women and according to the type of course (the likelihood is greater among men than women and among graduates of the Magen David Adom [MDA] course for civilians than graduates of army and other courses). The likelihood of continuing to work as a paramedic is greater for people with children, those with a higher education, and older workers.

### ***The Demand***

The examination of demand (based on interviews with key figures in the EMS, the Ministry of Health, and at hospitals) revealed that the boundaries that define the profession (i.e., the set of tasks that paramedics are authorized to perform) will apparently not change and will continue to correspond to the training given at present. However, it is possible that paramedics will be employed in new settings both within the health system and outside of it.

The examination of the balance between the forecasts for demand (based on the various scenarios regarding the size of the labor market that emerged from the interviews) and those for supply revealed that if the demand does not change beyond the natural expansion of two intensive-care ambulances per year, there could be a surplus of paramedic-course graduates by 2010. It also revealed that employing paramedics outside of the EMS market will not greatly increase the demand for them; it will slightly increase the demand, but a surplus will remain. However, if the ambulance fleet is upgraded to ALS (whether each vehicle has one or two paramedics), the

demand will increase substantially, and a significant shortage of paramedics will be produced unless more paramedics graduate every year. The study shows that it is possible to better plan the complement of paramedics required for a particular period and to train manpower according to the balance between demand and supply forecasts on the basis of various scenarios of the paramedic labor market. The decision as to how many paramedics should be trained in order to avoid a surplus or shortfall is, therefore, closely connected to policy regarding the scenario for the demand for paramedics.

### **Issues for Discussion and Directions for Action**

♦ ***What is the desirable life expectancy in the profession and how aware and prepared is the system for coping with an aging labor force?***

The labor force is, at present, relatively young, partly because in Israel the profession itself is young (only 20 years old). The EMS have not yet had to deal with large cohorts of older workers. In the interviews with key personnel in the EMS, most agreed that people over the age of 40–45 should not work as paramedics because of the hard physical requirements and the mental burnout in the profession. The study found that at the end of the coming decade, half of the paramedics that currently make up the labor force are expected to reach that age range. The paramedics also noted the need to ease the situation for older workers and to lower the retirement age. The system is evidently not yet ready to cope with such a situation. The solutions currently in force, such as promoting older workers to management or transferring them to other positions in the organization, will be insufficient when large numbers of people are involved. From the demand aspect, the question is: Do we require a professional labor force that will remain in the system in the short- or medium-term or should staff be recruited on a long-term basis, i.e., does the system want workers who will stay in their positions for a long time? The emergency health service system has to consider these issues, which will determine manpower recruitment policy as well as the provisions that the system should make for early retirement or changes in the working arrangements for older paramedics.

♦ ***How to cope with the challenges of promotion in the organization and professional development?***

The data on a skilled, educated, and committed labor force in a situation with limited organizational and professional promotion tracks pose a challenge for the EMS. The existing promotion track is a transition into management positions in the organizational hierarchy. However, it must be acknowledged that the organization has a limited supply of management positions, while there is no professional promotion track that may keep the paramedic in the profession. Professional development—for example in-service training—is another opportunity for promotion. The question is whether the current in-service training arrangements really respond to the paramedic's requirements for development and professional promotion.

♦ ***Should the expansion of the employment of paramedics outside EMS be pursued?***

The issue of the compatibility between supply and demand may be approached from two vantage points: the first views training as the point of departure, and examines its expansion or reduction

and the possible employment for its graduates; the second examines the expected demand according to various scenarios and its effect on the training system. The study examined both these aspects. The examination of the demand (and its compatibility with supply forecasts) suggests that the demand for paramedics is mainly related to the expansion of advanced life support services in EMS, and, to a lesser extent, to the expansion of the paramedics' labor market to hospital emergency rooms. In contrast, the expansion of the employment of paramedics beyond EMS will not greatly increase the demand for them; it will somewhat increase the demand and slightly reduce the surplus of paramedics in the labor market in the near future, but will not affect it in the longer term. Therefore, from the perspective of supply and the required extent of training, one should not look to such an expansion for a solution for a surplus that may occur if training of paramedics continues at the current level.

♦ ***Is the army a separate market?***

The IDF (Israel Defense Forces) is the second largest consumer of this professional labor force and the demand for paramedics in the army is increasing. However, the demand is short term, during the paramedics' military service. Some interviewees considered this a problem since, to meet the army's needs, the supply of professional manpower has swelled beyond the needs of the civilian market. Others assumed that most of the army paramedics would not remain in the profession in civilian life and that even those who did enter the civilian market would remain for only a short time. Perhaps, therefore, a distinction should be made between the civilian and military markets. Analysis of the data revealed that approximately 12% of graduates of the paramedic training courses completed army courses and that 42% of them work in the civilian market. The likelihood of army-course graduates working in the civilian market after a certain time is indeed lower than that of civilian-course graduates, but is not insignificant. Among army-course graduates who choose to continue working in the profession after their military service, a significant proportion (66%) will remain in the profession after four years. If, in the future, the proportion of graduates of military courses among all graduates of paramedic courses increases, this proportion and its implications for the civilian market supply should be taken into account when planning how many paramedics should be trained.

♦ ***Training through non-MDA frameworks: Implications for manpower supply***

Nineteen percent of paramedic course graduates did not train through Magen David Adom. Fifteen percent received their training in the emergency-medicine degree course at Ben-Gurion University of the Negev and the remainder in the emergency-medicine supplementary course at Assaf Harofeh Medical Center. The proportion of these graduates among workers in emergency medical organizations other than MDA is relatively high—40% (compared with 10% among paramedics at MDA). It was also found that among graduates of courses who had never worked in the profession in the civilian market, 50% were graduates of these courses. Evidently, some of the people who acquire their training in these frameworks do not even look for work in the profession. The proportion of those who remain in the profession after several years resembles more closely the rates among graduates of military courses than those among graduates of MDA's civilian courses. In other words, it is indeed lower, but not insignificant. Thus, the more

non-MDA training there is, the greater the need to consider these data during the comprehensive planning of training of paramedics.

♦ *The implications of recruiting women into the profession on manpower planning and training needs*

The employment of women as paramedics is a relatively recent development (none of the women in the sample had been in the profession for more than seven years). The proportion of women paramedics is still low—12% of the labor force. Moreover, women account for 21% of persons who used to work in the profession and no longer do so; and 44% of people who trained for the profession but never worked in it in the civilian market are women. The rate of women remaining in the profession is lower than that of men—approximately 50% after seven years (compared with 77% of men). In other words, they remain in the labor force for less time. If emergency medical organizations are considering increasing the proportion of women employed as paramedics, they must consider these data and examine the reasons for them in depth.

In conclusion, this study examined for the first time in Israel, the supply and forecast demand for paramedics, the characteristics of the work and the profession, as perceived by those who practice it, and the balance between supply and demand forecasts. The study findings make it possible to examine issues regarding the management of this human resource in different emergency medical service frameworks. Furthermore, the findings make it possible to better plan the required complement of paramedics for a range of time periods and scale the scope of the training programs according to a variety of scenarios in their labor market. These findings could also help the process of long-term strategic planning for this labor force.

# Table of Contents

1. Introduction	1
2. Literature Review – Manpower Planning	3
3. Detailed Study Goals	5
4. Study Methods	6
4.1 Study Design	6
4.2 Sampling Method and the Size of the Sample	6
4.3 Data Gathering Methods	6
4.4 Study Tools	6
4.5 Statistic Analysis	8
5. Manpower Supply	9
5.1 The Sources for Additional Professional Work Force	9
5.2 Course Graduates Who Work as Paramedics in the Civilian Market: Background Data and Employment Characteristics	10
5.3 The Characteristics of the Profession from the Point of View of Paramedics	14
5.4 Data on Those Who Had Worked as Paramedics in the Civilian Market and Do Not Work as Paramedics Today	26
5.5 Graduates of Courses Who Have Never Worked as Paramedics in the Civilian Market	28
5.6 Leaving the Profession and the Likelihood of Continuing Working as Paramedics	29
6. The Demand for Paramedics	33
6.1 The Change in the Demand for Paramedics Due to the Change in the Fleet of Emergency Vehicles	33
6.2 The Change in the Demand for Paramedics Due to the Expansion of Their Labor Market	34
7. The Balance Between Supply and Demand for Paramedics and the Implications on Manpower Planning	37
8. Discussion and Implications on Manpower Planning Policy	41
Bibliography	45



## **Appendices**

Appendix A: Data on Paramedics Who Work as Paramedics	48
Appendix B: Results of a Multivariable Analysis (Logistic Regressions) – Variables that Predict Satisfaction, Job Overload and Burnout	49
Appendix C: Data on Graduates of Courses for Paramedics Who Never Worked as Paramedics in the Civilian Market	53
Appendix D: Data on Rates of Leaving the Profession	54
Appendix E: List of Respondents	56
Appendix F: Supply and Demand Forecasts for Paramedics, by Demand Scenario	57

## List of Tables

Table 1:	The Characteristics of Paramedics Who Are Employed in the Civilian Market	11
Table 2:	Average Number of Working Hours a Week, of Shifts a Week, and of Shifts as Paramedic a Week	13
Table 3:	Participation in In-service Training in the Past Year, by Employer, Sex and Age	14
Table 4:	Reasons for Remaining in the Profession/Organization	15
Table 5:	Exposure to Difficult Events	16
Table 6:	The Extent to Which Stressors at Work Interfere With It "to a Large Extent" or "to a Great Extent"	18
Table 7:	Job Overload	18
Table 8:	Job Overload: The Percentage of Paramedics Who Replied "to a Large Extent" and "to a Medium Extent", by Background Variables and by Mode of Employment	19
Table 9:	Burnout – General Measure, Physical Fatigue, Cognitive Burnout and Emotional Exhaustion	20
Table 10:	Burnout: the Percentage of Paramedics Who Replied "Often" or Sometimes", by Background Variables and by Mode of Employment	21
Table 11:	Satisfaction at Work	22
Table 12:	Satisfaction at Work: the Percentage of Paramedics Who Replied "Extremely Satisfied" and "Very Satisfied", by Background Variables and by Mode of Employment	23
Table 13:	Satisfaction with the Profession	24
Table 14:	Evaluation of Health Status	25
Table 15:	Variables That Predict Intention to Change Profession – a Logistic Analysis	26
Table 16:	Those Who Had Worked as Paramedics in the Past, but Do Not Now	27
Table 17:	Reasons for Leaving the Profession, and Occupation After Leaving	28
Table 18:	Reasons for Not Working as Paramedics at All	29
Table 19:	The Accumulated Survival of Paramedics in the Profession	30

Table 20a:	The Accumulated Survival of Paramedics in the Profession among Men	31
Table 20b:	The Accumulated Survival of Paramedics in the Profession among Women	31
Table 21a:	The Accumulated Survival of Paramedics in the Profession among Graduates of a Civilian MDA Course	31
Table 21b:	The Accumulated Survival of Paramedics in the Profession among Graduates of a Military MDA Course	32
Table 21c:	The Accumulated Survival of Paramedics in the Profession among Graduates of Other Courses	32
Table 22:	Variables That Predict Leaving the Profession – Cox Regression	33
Table 23:	Scenarios of Demand for Paramedics	36
Table 24:	Supply and Demand Forecasts for Paramedics According to Scenario 1 – Natural Growth (Two MICA a Year)	38
Table 25:	Supply and Demand Forecasts for Paramedics According to Scenario 3b: Upgrading 50% of the BLS Ambulances to ALS Ambulances – Two Paramedics per MICA	39
Table 26:	Paramedics: Supply and Demand Forecasts According to the Different Scenarios of Demand for paramedics	40

## List of Tables in the Appendices

Table A1:	Paramedics Who Work in the Profession: Background Data	48
Table A2:	Average Number of Shifts a Week, by Position	48
Table B1:	Variables That Predict High Overload – a Logistic Regression	49
Table B2:	Variables That Predict a High Level of Burnout – a Logistic Regression	50
Table B3:	Variables That Predicts Low Satisfaction at Work – a Logistic Regression	51
Table B4:	Variables That Predicts Low Satisfaction with the Profession – a Logistic Regression	52
Table C1:	Paramedics Who Never Worked in the Profession in the Civilian Market	53
Table D1:	Paramedics Who Have Been Working for Five Years	54

Table D2: Annual Percentage of Paramedics Who Leave the Profession	54
Table D3: A Comparison of Background Characteristics of Paramedics Who Have Been Working for Five Years and Those Who Have Been Working for Ten Years	55
Table E1: Supply and Demand Forecasts for Paramedics According to Scenario 2: Two Paramedics in Each MICA	57
Table E2: Supply and Demand Forecasts for Paramedics According to Scenario 3a: Upgrading 50% of the BLS Ambulances to ALS Ambulances – One Paramedics per MICA	58
Table E3: Supply and Demand Forecasts for Paramedics According to Scenario 4a: Upgrading All Ambulances to ALS Ambulances – One Paramedics per Ambulance	59
Table E4: Supply and Demand Forecasts for Paramedics According to Scenario 4b: Upgrading All Ambulances to ALS Ambulances – Two Paramedics per Ambulance	60
Table E5: Supply and Demand Forecasts for Paramedics According to Scenario 5a: Employing Paramedics in Emergency and Trauma Rooms in All (27) of the General Hospitals	61
Table E6: Supply and Demand Forecasts for Paramedics According to Scenario 5b: Employing Paramedics in Emergency and Trauma Rooms in Six General Hospitals	62
Table E7: Supply and Demand Forecasts for Paramedics According to Scenario 7: Employing Paramedics in Public Places, Such as Malls, Stadiums and Airplanes	63
Table E8: Supply and Demand Forecasts for Paramedics According to Scenario 3b: Upgrading 50% of the BLS Ambulances to ALS Ambulances – Two Paramedics per MICA, Assuming that the Training System is Expanded and that Graduates Who Are Not Working Today, but May Wish to Work in the Future, Join the Work Force	64