

# Final Year Medical Students' Opinions on Internship in Croatia: All Roads Lead to Zagreb

Polasek Ozren<sup>1,2</sup> <opolasek@snz.hr>, Kolcic Ivana<sup>1</sup> <ikolcic@snz.hr>, Dzakula Aleksandar<sup>3</sup> <adzakula@snz.hr>, Bagat Mario<sup>4</sup> <mario.bagat@st.htnet.hr>

<sup>1</sup>Department of Medical Statistics, Epidemiology and Medical Informatics, Andrija Stampar School of Public Health, Medical School, University of Zagreb, Zagreb, Croatia;

<sup>2</sup>Public Health Sciences, University of Edinburgh, Edinburgh, UK

<sup>3</sup>Department of Social Medicine and Health Care Organization, Andrija Stampar School of Public Health, Medical School, University of Zagreb, Zagreb, Croatia;

<sup>4</sup>Croatian Institute for Health Insurance, Zagreb, Croatia

## Corresponding author

Ozren Polasek

Department of Medical Statistics, Epidemiology and Medical Informatics,  
Andrija Stampar School of Public Health, Rockefellerova 4, 10000 Zagreb, Croatia;

E-mail: opolasek@snz.hr

**Competing interests:** none declared

**Acknowledgements.** Authors would like to thank Ruth McQuillan (Public Health Sciences, University of Edinburgh) for the help in preparation of this manuscript. OP is supported by a PhD Scholarship from the University of Edinburgh, UK, and a Postgraduate Scholarship from the Ministry of Science, Education and Sports, Republic of Croatia.

## ABSTRACT

**BACKGROUND:** Medical education plays a very important role in human resources management. The aim of this study was to investigate final year medical students' internship workplace preferences and the reasons associated with their choices.

**METHOD:** A total of 204 out of 240 final year medical students from Zagreb University Medical School were surveyed. Logistic regression was used to analyse the factors underlying workplace preference.

**RESULTS:** Only 39 respondents (19.1%) wished to obtain internships outside Zagreb, the Croatian capital. Logistic regression yielded a single predictor variable significantly

associated with internship workplace preference: student's belief that he or she would secure a residency post in the desired specialty (odds ratio 0.32, 95% CI 0.12-0.86). Students who believed they would not get the desired specialty more often chose Zagreb as a preferred internship workplace. Several other predictor variables related to academic performance and gender were not significantly associated with internship workplace preference.

**CONCLUSIONS:** A strong preference for Zagreb as a desired internship workplace was established. Uncertainty about getting the desired specialty may be associated with choosing Zagreb as a workplace because students believe that being based in Zagreb increases their chances of finding alternative careers.

**Key words:** Intern, preference, workplace, Croatia, health system, medical student

**Competing interests:** none declared

**Author's contributions:** OP developed the original idea. All authors worked on survey development and implementation. IK was responsible for survey distribution and data collection. OP entered and analysed the data and drafted the first version of the article. All authors contributed to and approved the final manuscript version.

## **Introduction**

Human resources are a central issue in health system planning [1], and a major concern for both developed and developing countries [2]. Smaller, mid-income countries that do not rely on immigrant health workers depend on their own resources in producing a qualified health workforce. In such countries, careful balancing of the demand and supply of health care professionals is very important. This involves estimating the numbers of health care professionals needing to be educated in order to offset losses due to a variety of causes (for example, retirement, death, disability, emigration, leaving medicine, etc). Special attention must also be given to other elements, such as demographic change and secular trends, often requiring re-evaluation and re-balancing of the workforce. In its essence, good human resource management depends on the collection of reliable, evidence-based information [2]. Secondly, health care systems in mid-income countries require that all valuable human resources are carefully distributed among the desired and less desired areas of the country.

Health systems in developing countries are often cited as examples of geographical distribution problems [3]. Such studies generally indicate that graduated physicians and other health professionals mostly value highly urban or capital areas as preferred workplaces. As a consequence, rural and remote areas are often under-resourced in terms of skilled manpower, presenting a challenging problem in the planning and delivery of quality health care in those areas.

Despite a proliferation of initiatives and techniques aimed at attracting physicians to less desirable areas, no “magic bullet” has yet been found [4]. One technique that has shown some success in dealing with this problem uses a targeted undergraduate medical education programme to attract and retain physicians in rural areas [5].

Geographical disparities in the distribution of medical staff in Croatia have long been recognised [6] [7]. A recent study on final year medical students’ attitudes exhibited a substantial degree of confusion and resignation, and serious disparities in specialty preferences [8].

The aim of this study was to investigate internship workplace preference among final year medical students in Croatia, and to determine factors associated with their choices.

## **Subjects and Methods**

### *Design*

We analysed final year Zagreb University Medical School students' opinions on their internship workplace preference and factors associated with their decision. Students were surveyed during autumn 2004, several months before their graduation.

### *Setting*

The medical education system in Croatia is based on a six-year undergraduate curriculum. After graduation, students undertake an internship. The availability and location of each internship post are publicly announced, and graduated physicians can apply for any post they find attractive. After application, physicians are interviewed and scored on the basis of undergraduate academic record (grade point average, length of study, scientific involvement, etc.), and other extracurricular activities. Best-ranked applicants are accepted and start working as interns.

During a one-year internship, interns have to complete 18 rotations with major medical subjects (both clinical and public health). The interns choose the sequence of rotations, while the Ministry of Health and Welfare defines the duration and programme of each rotation. On completion of the internship, physicians are required to take a registration exam, after which they can register at the Croatian Medical Chamber and practise medicine in Croatia.

After obtaining their Licence, physicians can compete for a residency (specialisation). A similar scoring system is applied, again favouring undergraduate academic performance.

Analysis of the physician market in Croatia exhibits a significant decrease in the number of physicians employed in governmentally owned health facilities, a gradual increase in number of physicians in rented offices and a constant number of physicians employed in privately owned facilities [9]. Number of unemployed physicians is on a continuous decline, suggesting possible problems in the health care provision [10].

## *Subjects*

Final (sixth) year medical students were recruited for this study. Respondents were then divided into two groups: Zagreb resident (born and resident in Zagreb) and non-Zagreb resident (from other parts of Croatia and other countries). Surveys that did not contain sufficient information or contained intentionally misleading answers were excluded from the study.

## *Measurements*

The study was based on a survey consisting of 18 questions. Questions were grouped in five sections: (i) general data, comprising gender, grade point average, place of birth and age; (ii) specialization preferences, with questions on reasons and time-frame for specialty choice; (iii) scientific involvement questions; (iv) emigration preferences and (iv) internship workplace preferences.

## *Analysis*

Data were analyzed using both bi-variable and multivariable methods. The Chi-square test was used to analyse categorical data. Logistic regression was used to predict factors underlying the internship workplace preferences. Several academic parameters were used as predictor variables: grade point average, failure to pass any undergraduate year(s), students' beliefs that they would get the desired residency (specialty), readiness to emigrate, and scientific involvement measured through active involvement in research projects. Statistical analyses were performed with SPSS software, version 12.0.0 (SPSS Inc., Chicago, IL, USA), with significance set at  $P < 0.05$ .

## **Results**

A total of 211 students out of 240 enrolled were surveyed. Seven surveys were excluded from the analyses. The final sample consisted of 204 surveys (response rate 85.0%).

A total of 81 students were Zagreb residents (39.7%). Of the remainder, 106 students were non-Zagreb resident Croatians (52.0%), while 17 (8.3%) were not born in Croatia. Most of these (15; 88.2%) were born in Bosnia and Herzegovina.

A total of 140 (68.6%) students preferred to work in Zagreb, while 25 (12.3%) students expressed uncertainty with their workplace preference (Table 1). Among the latter group, a total of 7 (3.4%) students responded with a high level of resignation, saying that they would go to work “wherever they got paid for it”, or saying they would leave medicine. There was no significant gender difference in workplace preference ( $\chi^2=1.42$ , d.f.=1,  $P=0.234$ ). A total of 128 students (62.7%) believed that they would secure the desired specialty, exhibiting no gender differences ( $\chi^2=0.01$ , d.f.=1,  $P=0.907$ ).

A logistic regression model with workplace preference as the outcome variable was created. The model provided a good fit for the data, with Nagelkerke R Square 0.48, and the result of Hosmer and Lemeshow test supporting the data fit ( $P=0.746$ ). The only variable significantly associated with workplace preference was student’s belief that he or she would secure the residency in desired specialty (Table 2). A total of 96 (68.6%) students preferring internship in Zagreb believed they would secure the desired residency post, compared to 32 (82.1%) students preferring to work outside Zagreb.

## **Discussion**

This study exhibited a strong preference for internship workplace in Zagreb, the Croatian capital. A little less than 20% of students wanted to work outside Zagreb, where as much as three fourths of the Croatian population lives. This is a disappointingly low percent of students, considering that all students are obliged to complete a subject “Community Practice” during their fourth year of study. During this one-week course students are accommodated in remote settings and introduced to elements of working within primary and secondary health care. Studies of similar programmes with rural attachments from other countries have been positively associated with a preference for working in rural areas [11].

One serious implication of the current situation is the wastage of highly educated human resources. Analysis of the labour market showed no available internships in highly urban

areas (Zagreb, Rijeka, Osijek and Split), and variable number of available internships in the rest of the country [10]. With a finite number of internships available in Zagreb, physicians who are persistent in their desire to stay in the capital but unsuccessful in securing an internship often choose either temporary or permanent alternative careers. Compared to other parts of Croatia, Zagreb offers much broader career possibilities, with a number of clinical and preclinical research fellowships at various scientific institutions offered every year. These fellowships involve three to six years research period, during which a fellow is required to obtain a PhD degree, and, in the case of clinical and some public health attachments, also specialize in the medical field related to the fellowship post.

Besides strictly medical careers, various careers related to medicine are more common in Zagreb. These include sales representatives for medical equipment suppliers or provision of various other services related to medicine (e.g. as a part of the health Internet portal team, or telephone advisory services). Careers in the pharmaceutical industry have been very popular in recent years, with as many as 9% of final year medical students considering this as a possible career option and 3% of students interested only in the pharmaceutical industry as a permanent career [8]. Because there are so many attractive alternative career options available to medical graduates in Zagreb, those who do not believe that they will secure the residency in the specialty of their choice may choose to stay in Zagreb in the hope of finding a lucrative alternative career.

The findings of this study have rather depressing implications for the Croatian health and medical education systems. The fact that only 63% of students believed that they would secure the desired specialty must be related to a substantial level of dissatisfaction among students. This is consistent with the findings of a previous study, which found a great deal of confusion and resignation among final year medical students [8]. Depletion of the health workforce through emigration presents another possible danger to the Croatian health system. Although during the past few years a very low emigration rate among physicians has been recorded [12], the possibilities of emigration after Croatia joins the European Union are far more alarming [13].

The question of the Croatian health workforce balance has recently become a subject of substantial public interest. The physician market in Croatia has gradually changed over the last few years. The number of unemployed physicians declined from 384 registered in the

year 2000, to 72 in the year 2005 [10,14]. The same reports [10,14] indicated a serious projected shortage of senior medical staff in the years to come. Shortfalls of 398 consultants in internal medicine and 340 consultants in surgery are expected to occur by the year 2007. These shortages, combined with high percentages of students considering emigration [8, 13], and centralised workplace preferences could very negatively affect health care provision in underserved areas, particularly remote areas affected by the recent war and remote mountainous and Adriatic island regions.

A shortcoming of this study is the use of self-reported data, prone to possible recall bias. Nevertheless, the study clearly demonstrates a strong tendency for students to choose Zagreb as their desired internship workplace, associated with a widespread belief amongst students that they are unlikely to secure a residency of choice. With a potential shortage of physicians on the horizon, fuelled by the possibility of emigration after Croatia enters the European Union, the Croatian healthcare and medical education systems require a thorough evaluation and a careful projection of health workforce demands.

## REFERENCES

1. Dussault G, Dubois CA. Human resources for health policies: a critical component in health policies. *Human Resources for Health*. 2003;1(1):1.
2. Diallo K, Zurn P, Gupta N, Dal Poz M. Monitoring and evaluation of human resources for health: an international perspective. *Human Resources for Health*. 2003 Apr 14;1(1):3.
3. Zurn P, Dal Poz MR, Stilwell B, Adams O. Imbalance in the health workforce. *Human Resources for Health* 2004;2(1):13.
4. Buchan J. What difference does ("good") HRM make? *Human Resources for Health* 2004;2(1):6
5. Rabinowitz HK, Paynter NP. The role of the medical school in rural graduate medical education: pipeline or control valve? *Journal of Rural Health*. 2000;16:249-253.
6. Steinman L. Maldistribution of physicians in Yugoslavia. *Journal of Medical Education* 1974; 49: 182
7. Reamy J. Managing Physician Resources: East and West. *Croat Med J*. 1998;39(3):234-240

8. Kolcic I, Polasek O, Mihalj H, Gombac E, Kraljevic V, Kraljevic I, Krakar G. Research involvement, specialty choice, and emigration preferences of final year medical students in Croatia. *Croat Med J*. 2005;46(1):88-95.
9. Erceg M, Kuzman M, Rodin U (Eds.) *Croatian Health Service Yearbook 2003*. Croatian National Institute of Public Health (Figure 1.3., page 77).
10. Bagat M, Sekelj Kauzlarić K, Drakulić V. Croatian Medical Doctors at Labor Market. *Croat Med J* (*In press*).
11. Peach HG, Bath NE. Comparison of rural and non-rural students undertaking a voluntary rural placement in the early years of medical course. *Med Educ* 2000;43:231-233
12. Pifat-Mrzljak G, Juros L, Vizek-Vidovic V. Brain Drain and the Academic and Intellectual Labour Market in Croatia - a case study -. Available from URL: <http://www.unizg.hr/unesco/braindrain/> [Accessed Sep 27,2005]
13. Polasek O, Kolcic I. Croatia's brain drain. *BMJ* 2005;331:1204
14. Croatian Medical Chamber. Croatia lacks physicians! [In Croatian] [www.hlk.hr/default.asp?ru=1&gl=200507010000003&sid=&jezik=1](http://www.hlk.hr/default.asp?ru=1&gl=200507010000003&sid=&jezik=1) (accessed 4 Sep 2005).

Table 1. Residence and workplace preference among the final year medical students from Zagreb University Medical School, academic year 2004/05

Workplace preference	Residence		Total
	Zagreb N (%)	Other N (%)	
Zagreb	59 (72.8)	81 (65.9)	140 (68.6)
Other	13 (16.1)	26 (21.1)	39 (19.1)
Not sure/Don't know	9 (11.1)	16 (13.0)	25 (12.3)
Total	81 (100.0)	123 (100.0)	204 (100.0)

Table 2. Logistic regression model predicting workplace preference among final year Zagreb University Medical School students, academic year 2004/05

Predictor	<i>P</i>	OR (95% CI*)
Gender	0.351	0.66 (0.27-1.58)
Age	0.746	0.98 (0.85-1.10)
Grade point average	0.117	2.03 (0.84-4.90)
Ever failed a study year	0.195	1.78 (0.74-4.26)
Believed they would secure the desired specialty	0.025	0.32 (0.12-0.86)
Readiness to emigrate	0.710	1.18 (0.49-2.85)
Involved in scientific work as a student	0.124	2.56 (0.77-8.48)
Interest in scientific work in the future	0.266	1.71 (0.67-4.39)

\*CI – confidence intervals