

Original Research Article (Brief Communication)

Resident doctors and medical specialty preferences in Greece: The example of Eastern Macedonia and Thrace

Papadopoulos Vasilios

*"AKESIOS" Dialysis Center, Xanthi, Greece**Correspondence Address: Papadopoulos Vasilios, "AKESIOS" Dialysis Center, Xanthi, Greece, email: vaspapmd@gmail.com***Abstract**

Aims: The present study is intended to describe the current status regarding the preferences of resident doctors evaluating real-world data from the Region of Eastern Macedonia - Thrace, and to evaluate the potential occupational and territorial discrepancies that may be observed.

Methods: The official website of the Region of Eastern Macedonia - Thrace was accessed on June 8, 2023, and December 28, 2023, for official data regarding the absolute numbers of occupied and vacant places per specialty and Regional Unit. Five medical specialties, namely Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine, were explicitly assessed using paired data. Data regarding all other medical specialties had been additionally retrieved and used when appropriate. The Chi-square test was used to test goodness of fit.

Results: The distribution of occupied places by resident doctors per medical specialty (Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine), and per Regional Unit is unequal at both June and December 2023 ($p < 0.001$). The ratio between occupied and offered places was comparable between June 2023 and December 2023 regarding all medical specialties and Regional Units. There are no vacant places for specialization in Pediatrics, Ophthalmology, Otolaryngology, and Psychiatry. Only scarce vacant places are offered for specialization in Obstetrics and Gynecology and Anesthesiology. On the contrary, there is no interest to specialize in Oncology, Pathology, and Occupational Medicine.

Conclusion: In conclusion, resident doctors are highly reluctant to specialize in General Medicine, while a heavy imbalance is observed between the Regional Units concerning the occupation of offered places for specialization. These observations indicate that incentives for specialization in General Medicine should be prioritized and imply the need for further investigation to evaluate the underlying causes and the potential focused solutions.

Introduction

The Region of Eastern Macedonia and Thrace is located in North-Eastern Greece [1], covers an area of 14,179 km² [2], and is inhabited by 562,201 people [3]. Six civil hospitals are located within its district; two of them (University General Hospital of Alexandroupolis [4] and General Hospital of Didymoteicho [5]) are located in the Regional Unit of Evros, while the other four in the Regional Units of Rodopi (General Hospital of Komotini "Sismanogleio" [6]), Xanthi (General Hospital of Xanthi [7]), Kavala (General Hospital of Kavala [8]), and Drama (General Hospital of Drama [9]).

Greece is characterized by adequate, if not abundant, medical specialists. According to

the latest available data for 2022, there are 6.4 physicians per 1,000 inhabitants [2]. Even though the whole medical population has increased from 2018 to 2022 by 0.3 per 1,000 inhabitants, the ratio of General Medicine specialists per total physicians has constantly waned during these years. In detail, General Medicine specialists represented 6.3% of the total physicians in 2022, while this percentage was 0.3% higher four years ago. These data imply that, while as much as one physician per 156 inhabitants exists, only 1 General Medicine specialist per 2,500 inhabitants is available. General Medicine specialists outnumber for short Obstetricians/Gynecologists and are comparable to Pediatricians. On the other

hand, specialists in medical and surgical group count about three- and eight-fold the number of General Medicine specialists [2].

General Medicine is under-resourced in all European countries, thus affecting recruitment [10]. Mariolis et al. explicitly stated that Greek medical students are highly reluctant to choose General Medicine as a career [11]. A recent Japanese study identified a large gap between the interest of medical students to specialize in General Medicine and motivation. In this study, the only two perceptions that had been positively associated with motivation to become a General Medicine specialist were the needs of society, and the lack of General Medicine educators. On the contrary, the fact that medical students experienced limited exposure to General Medicine during their curriculum discouraged them [12].

Interestingly, choosing General Medicine was positively correlated with “work-life balance” though negatively with “scientific orientation” [13]. However, General Medicine perceptions have substantially altered after the COVID-19 outbreak [14]. Lastly, artificial intelligence (AI) is expected to impact the role of General Medicine specialists significantly; the most favorable version of this revolutionary change focuses on the potential supporting role AI could contribute [15].

There are significant differences in the preferences of young doctors among medical specialties. Pehlivanidou et al. report that statistically significant correlations were verified between the field of specialization and scientific interest, waiting time for commencement of training, higher remuneration, and higher social status [16]. In addition to General Medicine, other specialties such as Anesthesiology are considered understaffed. To compensate for, the recent Law 4999 / 2022 introduced an additional

allowance of 250 Euros per month to doctors who choose the specialty of Anesthesiology.

The present study is intended to describe the current status regarding the preferences of resident doctors evaluating real-world data from the Region of Eastern Macedonia - Thrace, Greece, and to evaluate the potential occupational and territorial discrepancies that may be observed.

Materials and Methods

The official website of the Region of Eastern Macedonia - Thrace was accessed on December 28, 2023, for official data regarding the absolute numbers of occupied and vacant places per specialty and Regional Unit [17]. These data were compared with those accessed on June 8, 2023, and used in a recent relevant publication in the local media [18]. Paired data (June 2023 vs. December 2023) were available for five medical specialties, namely Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine.

Five medical specialties, namely Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine, were explicitly assessed using paired data (June 2023 vs. December 2023). Moreover, data regarding all other medical specialties had been additionally retrieved and used when appropriate.

The Chi-square test was used to judge the goodness of fit between observed and expected results of categorical variables; if $\geq 25\%$ of cells had expected values < 5 , the Fisher's exact test was alternatively preferred. The online statistical tool available freely at <https://www.quantitativeskills.com/sisa/statistics/fiveby2.htm> was used for that purpose. Similarly, the online statistical tool available freely at [https://home.ubalt.edu/ntsbarsh/Business-stat/ otherapplets/ PairedProp.htm](https://home.ubalt.edu/ntsbarsh/Business-stat/otherapplets/ PairedProp.htm) was preferred for comparing between two dependent proportions. The level of statistical

significance was set to $p = 0.05$. All reported p -values are two-sided.

Results

The distribution of occupied places by resident doctors per medical specialty concerning Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine is depicted in Table 1; this distribution is unequal at both time points, namely December 2023 ($\chi^2 = 36.63$; $df = 4$; $p < 0.001$), and June 2023 ($\chi^2 = 29.40$; $df = 4$; $p < 0.001$).

The ratio between occupied and offered places was comparable between June 2023 and December 2023 concerning Surgery ($p = 0.328$), Orthopedics ($p = 1.000$), Internal Medicine ($p = 0.389$), Cardiology ($p = 0.338$), and General Medicine ($p = 0.258$).

Specialty	June 2023	December 2023	p -value
Surgery	38/64 (59%)	42/64 (66%)	0.328
Orthopedics	18/29 (62%)	18/29 (62%)	1.000
Internal Medicine	58/73 (79%)	55/73 (75%)	0.389
Cardiology	17/26 (65%)	21/28 (75%)	0.338
General Medicine	16/51 (31%)	12/49 (24%)	0.258
Total	147/243 (60%)	148/243 (61%)	

Table 1. Occupancy of resident positions in the Regional Units of the Region of Eastern Macedonia and Thrace by specialty (comparison between June and December 2023)

The distribution of occupied places by resident doctors per Regional Unit concerning the medical specialties of Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine is depicted in Table 2; this distribution is unequal at both time points, namely December 2023 ($\chi^2 = 68.36$; $df = 4$; $p < 0.001$), and June 2023 ($\chi^2 = 35.99$; $df = 4$; $p < 0.001$).

The ratio between occupied and offered places was comparable between June 2023 and December 2023 concerning the Regional Unit of Evros ($p = 1.000$), Rodopi ($p = 0.248$),

Xanthi ($p = 0.162$), Kavala ($p = 0.153$), and Drama ($p = 1.000$).

There are currently no vacant places for specialization in several medical specialties, including Pediatrics (33 offered places in total), Ophthalmology (17 offered places in total), Otolaryngology – ENT (12 offered places in total), and Psychiatry (8 offered places in total, all in the University General Hospital of Alexandroupolis). Moreover, there are only scarce vacant places for medical specialties such as Obstetrics and Gynecology (1 out of 18 offered places) and Anesthesiology (2 out of 22 offered places).

Regional Unit	June 2023	December 2023	p -value
Evros†	70/94 (74%)	70/94 (74%)	1.000
Rodopi	19/30 (63%)	15/30 (50%)	0.248
Xanthi	9/35 (26%)	5/35 (14%)	0.162
Kavala	34/46 (74%)	43/46 (93%)	0.153
Drama	15/38 (39%)	15/38 (39%)	1.000
Total	147/243 (60%)	148/243 (61%)	

† Data from both hospitals of Evros Regional Unit are included (Alexandroupoli and Didymoteicho).

Table 2. Coverage of offered positions for the specialties of Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine per Regional Unit (comparison between June and December 2023)

There are many medical specialties for which plenty of vacant places are offered, including Hematology, Nephrology, Urology, Biopathology (Microbiology), and Radiology. Unfortunately, no interest has been demonstrated in Oncology, Pathology, and Occupational Medicine, for which all offered places are currently vacant.

Discussion

The present study describes the current status regarding the preferences of resident doctors evaluating official data from the Region of Eastern Macedonia – Thrace, Greece. We have demonstrated that only a minority of resident doctors prefers key

medical specialties such as General Medicine and that the occupation of places offered for medical specialization is unequally distributed among the Regional Units, rendering the hospitals of Evros and Kavala overcrowded compared to the other Regional Units.

It is questionable why only 24% of the places offered for the General Medicine specialty are currently occupied. Interestingly, this negative trend intensified during the last six months, as the corresponding percentage of coverage of the General Medicine positions offered in June 2023 was 31%. This evidence is in keeping with previous relevant reports [11] and, in combination with the observed diminishing ratio of General Medicine specialists per total physicians [2]. Whether this discrepancy can be attributed to parameters such as the quality of the training curriculum, the adequacy of instructors, and the prospects for employment remains to be investigated.

Resident doctors prefer the hospitals of the Regional Units of Evros and Kavala. Interestingly, while in June 2023, the total coverage of the offered positions for the specialties of Surgery, Orthopedics, Internal Medicine, Cardiology, and General Medicine was similar in both Regional Units (74%), in December 2023, the Kavala Hospital prevails (93%). On the contrary, the corresponding percentage for the Xanthi Hospital is meager (14%), revealing that the Xanthi Hospital is the least attractive for newcomers; the reasons for this utter discrepancy must be sought and addressed.

A limitation of the present study is that the official sources' data does not include resident doctors who may still be in service by extension of their initial contract. Nevertheless, there is no indication that the nature of this missing data is "missing not at random" (MNAR); thus, these data are believed to be indicative of the choices of

young doctors regarding obtaining a specialty in the Region of Eastern Macedonia and Thrace.

Conclusions

In conclusion, resident doctors are highly reluctant to specialize in General Medicine, while a heavy imbalance is observed between the Regional Units concerning the occupation of offered places for specialization. These observations indicate that incentives for specialization in General Medicine should be prioritized and imply the need for further investigation to evaluate the underlying causes and the potential focused solutions.

References

1. Region of Eastern Macedonia and Thrace. <https://www.pamth.gov.gr/index.php/en>. Accessed on Jan, 2024.
2. Hellenic Statistical Authority. Greece in Figures; October - December 2023. https://www.statistics.gr/documents/20181/18074233/GreeceinFigures_2023Q4_EN.pdf/1e72c05a-0802-1b9d-aca0-dbc5be5d355.
3. Hellenic Statistical Authority. Results of the Greek 2021 Census. https://elstat-outsourcers.statistics.gr/Census2022_GR.pdf. Accessed on Jan 4, 2024.
4. University General Hospital of Alexandroupolis. <https://pgna.gr/>. Accessed on Jan 4, 2024.
5. General Hospital of Didymoteicho. <https://did-hosp.gr/>. Accessed on Jan 4, 2024.
6. General Hospital of Komotini "Sismanogleio". <http://www.komotini-hospital.gr/> / Accessed on Jan 4, 2024.
7. General Hospital of Xanthi. <https://hosp-xanthi.gr/>. Accessed on Jan 4, 2024.
8. General Hospital of Kavala. <https://kalahospital.gr/>. Accessed on Jan 4, 2024.
9. General Hospital of Drama. <https://www.dramahospital.gr/>. Accessed on Jan 4, 2024.

10. Harding A, Vallersnes OM, Carelli F, Kiknadze N, Karppinen H, Simmenroth A. European standards for undergraduate medical education in general practice; a blueprint - for action. *Educ Prim Care*. 2023 Jan;34(1):2-6. doi: 10.1080 / 14739879.2022.2155997. Epub 2023 Feb 2. PMID: 36730558.

11. Mariolis A, Mihas C, Alevizos A, Gizlis V, Mariolis T, Marayiannis K, Tountas Y, Stefanadis C, Philalithis A, Creatsas G. General Practice as a career choice among undergraduate medical students in Greece. *BMC Med Educ*. 2007 Jun 1;7:15. doi: 10.1186/1472-6920-7-15. PMID: 17543106; PMCID: PMC1899489.

12. Nishikawa K, Ohta R, Sano C. Factors Associated with Motivation for General Medicine among Rural Medical Students: A Cross-Sectional Study. *Int J Environ Res Public Health*. 2022 Apr 22;19(9):5102. doi: 10.3390/ijerph19095102. PMID: 35564495; PMCID: PMC9100026.

13. Windak A, Frese T, Hummers E, Klemenc Ketis Z, Tsukagoshi S, Vilaseca J, Vinker S, Ungan M. Academic general practice/family medicine in times of COVID-19 - Perspective of WONCA Europe. *Eur J Gen Pract*. 2020 Dec;26(1):182-188. doi: 10.1080/13814788.2020.1855136. PMID: 33337939; PMCID: PMC7751383.

14. Kawamoto R, Ninomiya D, Kasai Y, Kusunoki T, Ohtsuka N, Kumagi T, Abe M. Factors

associated with the choice of general medicine as a career among Japanese medical students. *Med Educ Online*. 2016 May 11;21:29448. doi: 10.3402/meo.v21.29448. PMID: 27172894; PMCID: PMC4865794.

15. Summerton N, Cansdale M. Artificial intelligence and diagnosis in general practice. *Br J Gen Pract*. 2019 Jul;69(684):324-325. doi: 10.3399/bjgp19X704165. PMID: 31249070; PMCID: PMC6592326.

16. Pehlivanidou A, Souliotis K, Kalafati M, Belali T, Tsamadias J, Giannaka F, Tountas J. Criteria that affect the selection of the field of medical specialization in Greece. *Archives of Hellenic Medicine* 2008; 25(2): 167-176.

17. Region of Eastern Macedonia and Thrace, Medical Specialties. <https://www.pamth.gov.gr/index.php/el/politis/iatrikes-eidikotites>. Accessed on Dec 28, 2023.

18. Papadopoulos V. Resident doctors in the Region of Eastern Macedonia and Thrace – evidence and concerns (Greek). *Agonas (Xanthi)*. 2023 June <https://agonas.gr/2023/06/09/%ce%b5%ce%b9%ce%b4%ce%b9%ce%ba%ce%b5%cf%85%cf%8c%ce%bc%ce%b5%ce%bd%ce%bf%ce%b9-%ce%b9%ce%b1%cf%84%cf%81%ce%bf%ce%af-%cf%83%cf%84%ce%b7%ce%bd-%ce%b1-%ce%bc-%ce%b8-%cf%83%cf%84%ce%bf%ce%b9/>. Accessed on Jan 4, 2024.