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## The main concerns of European anaesthesiology postgraduate trainees: A European survey

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### ABSTRACT

This is the first study intended to identify the European anaesthesiology trainees' main concerns, to initiate a process of improvement of the training in anaesthesiology by the European Society of Anaesthesiology (ESA). The authors developed an electronic survey which addressed seven different concerns: autonomy transition, technical skills, exchange programs, residency costs, residency workload, employment prospects and educational contents/preparation for the European Diploma in Anaesthesiology and Intensive Care (EDAIC). The survey was disseminated by email to all anaesthesiology trainees registered in ESA and all European National Societies were asked to distribute the survey to their graduating trainees. 665 trainees initiated the survey with a completion rate of 54.6%. The trainees' main concerns were in descending order: educational contents, residency costs, employment prospects, residency workload, exchange programs, technical skills and autonomy transition. This report analyzes the three main concerns in more detail. 68% of respondents were unaware of the existence of the ESA e-learning platform. Other means to improve the preparation for the EDAIC such as a multiple-choice questions book should be developed. The main reason for not becoming an ESA Trainee member was the associated cost and 68% of respondents gave up activities or opportunities during their residency due to economic constraints; 56% of respondents considered emigrating for economic reasons and 28% elected Northern/Central Europe. The results of the present survey may provide additional background information for the development of specific improvements in strategies for training in anaesthesiology.

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### 1. Introduction

Anaesthesiology has significantly changed over the last decades. New drugs, monitoring devices and techniques have been developed and a major outcome has been a marked increase in patient

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safety [1]. Consequently, the scope of anaesthesiology has expanded into multiple subspecialties. Its activity has increased in both inpatient and outpatient settings [1–3]. To confront the evolving challenges of patients and the health systems, educational changes and improvements in the postgraduate training programs must follow [1,2]. Effective implementation of educational changes mandates adequate communication between all educational stakeholders and postgraduate trainees [4].

Surveys are important tools to uncover needed improvements for medical training [4]. However, only a few published surveys addressed the anaesthesiology postgraduate trainees' concerns [4–7] and none looked at the European level.

Since 2006, the United Kingdom (UK) based General Medical Council (GMC), has been running an annual comprehensive survey asking all trainees for their views on the training. This aims to ensure that general medical education and training meets the high quality standards set to support medical care and patient safety across the UK [4,5].

Another link between anaesthesia training programme stakeholders and their trainees are national and international trainee organisations. The UK "Group of Anaesthetists in Training" (GAT), initiated in 1967 now with more than 3500 members, represents the anaesthesiology trainees' views among the decision-makers [8]. Similarly, the American Society of Anaesthesiology Resident Component (ASA-RC) was initiated in the USA in 1988 to encourage anaesthesiology trainees' participation in ASA activities [9].

In 2014, the European Society of Anaesthesiology's (ESA) Trainee Committee (ESATC) founded the ESA Trainee Network (ESATN) to facilitate communication and exchange of information between European anaesthesiology trainees and the ESA Council and Board of Directors. This network aims to promote training and education for anaesthesiology trainees throughout Europe. Another very important aim is to receive feedback from European anaesthesiology trainees about their needs and expectations from ESA [10].

A first initiative of the ESATC was to identify the main concerns of European anaesthesiology trainees through this European wide cross-sectional survey in order to initiate improvement of anaesthesia education by the ESA.

## 2. Methods

This study was approved by the Ethics Committee and the Research Board of the Department of Education, Training and Investigation of Centro Hospitalar do Porto, Portugal.

Searching the available literature, seven different items were identified and addressed in the survey [4–7,11–15]: autonomy transition, technical skills, exchange programmes, residency costs, residency workload, employment prospects and educational contents/European Diploma in Anaesthesiology and Intensive Care Medicine (EDAIC).

This cross-sectional survey was designed by the authors (DSF, ASK, DL, BA and HBC) using close-ended questions with the help of commercially available software (Survey Monkey Inc., Palo Alto, California, USA, [www.surveymonkey.com](http://www.surveymonkey.com)). The survey was divided into ten parts. The first part comprised questions about demographic aspects. The following seven parts corresponded with the seven identified concerns, each with specific questions selected using a pragmatic approach. The anaesthesiology trainees' opinion and satisfaction were assessed using a Likert scale from 1 to 10 with descriptors. In the ninth part, trainees were asked to sort each concern in terms of priority to improve using another Likert scale rating between 1 and 7, where 1 was "less important" and 7 "most important". The last part was designated as "networking" and included three questions regarding the best means to improve networking among trainees. The entire questionnaire is provided as

supplementary material available online ([appendix 1](#)).

Prior to its official submission, our survey was piloted for comprehensibility by a group of twenty European trainees. After the final post-pilot adjustments, the invitation to the survey was disseminated via email from the ESA secretariat.

We included in the survey and sent out mails to: 1) all ESA trainee members (an anaesthesiology trainee was defined as any medical doctor who was trained in a specific anaesthesiology programme which is approved by the respective country). 2) All abstract presenters from the ESA Annual Meetings 2014 and 2015. 3) An email asking for the dissemination of the survey link to their respective anaesthesiology trainees was sent to all presidents of each European National Society of Anaesthesiology, to each member of the National Anaesthesiologists Societies Committee (NASC) of the ESA and to each member of the ESA Council. 4) Additionally, the anaesthesiology trainee could answer the survey at the ESA trainees' booth at the 2015 ESA annual meeting. All non-anaesthesiology trainees were excluded from the analysis.

The survey was sent out in mid-May of 2015, and the link to access it was made available for four months, until mid-September 2015. After completion of the survey, the link could not be reopened. The survey link was resent to all recipients in July and September two more times.

According to the absolute number of trainees in each European country [16], the authors considered that if a country had more than thirty anaesthesiology trainees that initiated the survey, these results could be representative of the trainees from that country.

Descriptive statistics characterise qualitative results with absolute and relative frequencies (n and %), and normally distributed quantitative results with mean and standard deviation (SD). The median (P50) and interquartile range (IQR) were used to describe ordinal results [17].

The sample was divided according to the status of the participant (have completed the questionnaire or not). Demographic characteristics between these two groups were compared using the Chi-square test for dichotomous data, Student's T-test test for normally distributed data or the Mann-Whitney test for non-parametric data. The significance level was determined as 0.05.

First, the main concerns of the seven topics asked were ranked according to the respective Likert scale, as described above. Then, an in-depth analysis of the three main concerns was performed.

In order to perform a sub-analysis, the sample was divided into four groups. The authors grouped the non-European countries and divided Europe into three regions (Southern, Eastern and Northern/Central Europe), according to the geographic and economic distribution of the countries that participated in the survey [18] (Table 5, supplementary material). Differences between regions were tested using the Chi-square test, ANOVA or Kruskal-Wallis test, according to the nature of the results.

Statistical analyses were performed using IBM SPSS Statistics 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) [19].

## 3. Results

A total of 1210 individuals opened the link to the survey, but only 852 initiated it. Of these, 665 were anaesthesiology trainees, the final sample. From the final sample, 54.6% (n = 363) of the anaesthesiology trainees completed the survey (Fig. 1). Due to the decreasing answer rate along the survey, for each question was mentioned the absolute number of respondents (n).

Trainees from 45 countries participated in this survey: 13 countries from a non-European Region and 6, 10 and 16 countries from Southern, Northern and Eastern European Regions, respectively (Table 5, supplementary material). Only 7 out of 45 countries

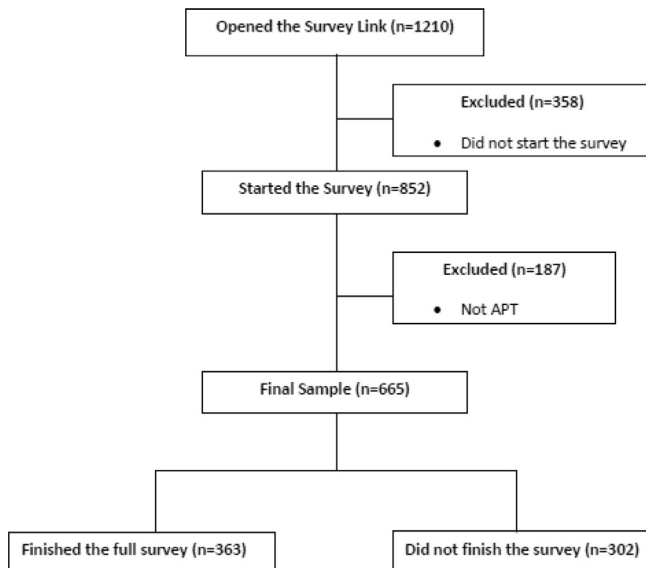


Fig. 1. Flowchart of the anaesthesiology trainees (APT) included in this study.

had more than thirty anaesthesiology trainees who initiated the survey (Table 6, supplementary material).

The anaesthesiology trainees' characteristics are displayed in Table 1. The anaesthesiology trainees that did not complete the survey were older, of a non-European region, and mostly non-ESA members (Table 7, supplementary material).

The main concerns of the 363 anaesthesiology trainees who completed the questionnaire in descending order were “educational contents/EDAIC” (median = 5; IQR = 3–7), “residency costs” (median = 5; IQR = 3–6), “employment prospects” (median = 4; IQR = 3–5), “residency workload” (median = 4; IQR = 3–5), “exchange programmes” (median = 4; IQR = 2–5), “technical skills” (median = 4; IQR = 2–6) and “autonomy transition” (median = 3; IQR = 1–5). Therefore, the three main concerns were “educational contents/EDAIC”, “residency costs” and “employment prospects”. The tables with the results concerning the four remaining concerns are provided as supplementary material available online (Tables 9, 10, 11 and 12).

Table 1  
Characteristics of the final sample.

| Variable                      | N   | n (%) or median (IQR) or Mean (SD) |
|-------------------------------|-----|------------------------------------|
| <b>Gender</b>                 | 665 |                                    |
| Female                        |     | 343 (52%)                          |
| <b>Age (years)</b>            | 665 | 30.9 (4.9)                         |
| <b>Year of training</b>       | 643 | 3 (2–4)                            |
| <b>PhD program</b>            | 665 |                                    |
| Yes                           |     | 195 (29.3%)                        |
| <b>Main field of interest</b> | 665 |                                    |
| Critical care                 |     | 281 (42.3%)                        |
| Loco-regional anaesthesia     |     | 164 (24.7%)                        |
| Emergency medicine            |     | 110 (16.5%)                        |
| Cardiothoracic                |     | 45 (6.8%)                          |
| Research                      |     | 31 (4.7%)                          |
| Pain medicine                 |     | 29 (4.4%)                          |
| Palliative Care               |     | 5 (0.8%)                           |
| <b>Region</b>                 | 664 |                                    |
| North/Central Europe          |     | 228 (34.3%)                        |
| South Europe                  |     | 196 (29.5%)                        |
| Eastern Europe                |     | 170 (25.6%)                        |
| Non-European                  |     | 70 (10.5%)                         |
| <b>ESA member</b>             | 665 |                                    |
| Yes                           |     | 312 (46.9%)                        |

The graphic distribution of the medians for each concern among the considered regions (Fig. 2) demonstrated that: “educational contents/EDAIC” was still the main concern for all four regions; “residency costs” were the second main concern except for the Eastern European region, despite having the same median as the second, third and fourth concern for that region; “employment prospects” was the third main concern for the Northern/Central European region, the second for the Eastern European region and the fourth main concern for the Southern and non-European regions (Fig. 2).

When analysed by region using the Kruskal-Wallis test, differences were found for: “educational contents/EDAIC” (higher concern for Eastern European and non-European regions;  $p = .014$ ), “residency costs” (lesser concern for Eastern European region;  $p = .034$ ), “residency workload” and “autonomy transition” (higher concerns for Southern and Northern/Central European regions;  $p = .048$  and  $p = .002$ , respectively) (Fig. 2).

When the four clustered regions were compared to the mean age, gender proportion, year of training and ESA membership status, differences were found between all regions. Trainees from Northern/Central Europe were the group with a higher mean age, higher number of years of training and lower percentage that attended a PhD programme (Table 8, supplementary material).

Table 2 provides details on “educational contents/EDAIC”, the highest ranked trainees' concern. More than two thirds, 68% ( $n = 294$ ) of the respondents were unaware of the existence of the ESA e-learning platform, and 69% ( $n = 298$ ) of the ESA Refresher Courses. To be prepared for the EDAIC: Multiple-Choice-Questions Book ( $n = 433$ ; median = 7; IQR = 6–9) and the Online Preparation Exams ( $n = 427$ ; median = 8; IQR = 5–9) were rated as useful and all inquired topics were considered to be at least “moderately important” to develop. 66% ( $n = 233$ ) of the respondents were interested in passing the EDAIC, but 55% ( $n = 126$ ) were not due to the associated costs.

“Residency costs”, the second highest ranked concern (Table 3), showed that trainees were at least “moderately affected” by economic reasons to carry out all the activities that were questioned, especially participation in international congresses ( $n = 446$ ; median = 8; IQR = 6–9) and applications for internships abroad ( $n = 443$ ; median = 7; IQR = 5–9). Only 6% ( $n = 29$ ) were fully supported by their departments to present scientific works at conferences. Interestingly, 68% ( $n = 316$ ) of the respondents gave up activities or opportunities during their residency due to economic constraints, but 58% ( $n = 268$ ) of the respondents do extra-shifts for economic reasons.

Of the non-ESA anaesthesiology trainees, when asked why they were non-ESA members ( $n = 350$ ), 28% ( $n = 98$ ) mentioned costs, 13% ( $n = 44$ ) had never heard about it, 4% ( $n = 13$ ) said it was not useful and 56% ( $n = 195$ ) considered becoming members in the future.

“Employment prospects” (Table 4) were the third concern. 56% ( $n = 257$ ) of the respondents considered emigrating for economic reasons (32.1%;  $n = 86$ ) and to advance their career ( $n = 83$ ; 31%). The most attractive regions around the world were Northern Europe (28%;  $n = 71$ ), Western Europe ( $n = 65$ ; 25%) and Central Europe ( $n = 45$ ; 18%). Main “emigration barriers” were dealing with bureaucracy ( $n = 385$ ; median = 6; IQR = 3–7.5) and obtaining a license to practice abroad ( $n = 385$ ; median = 6; IQR = 3–7).

The quality of this survey was considered as “good” ( $n = 421$ ; median = 7; IQR = 5–8) and the importance of having a European anaesthesiology trainees network as “very important” ( $n = 416$ ; median = 8; IQR = 7–9). When asked about the best way to improve networking ( $n = 429$ ), 43% of the respondents preferred online social networking and 35% an annual trainees' meeting.

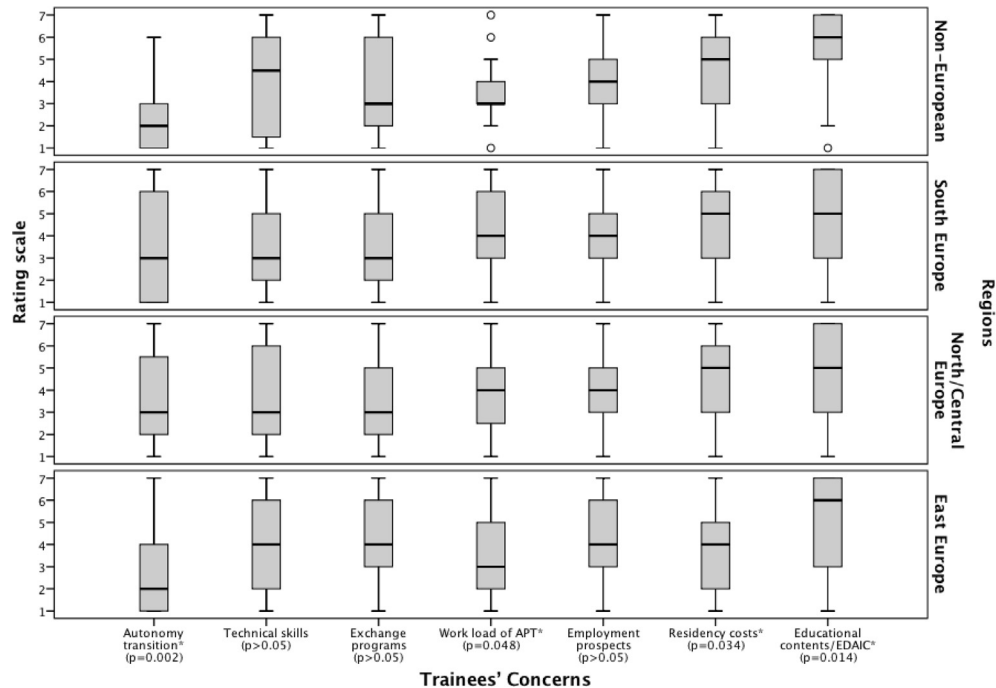


Fig. 2. Concerns of the anaesthesiology trainees distributed by region.  
\*Kruskal-Wallis test.

**Table 2**  
Anaesthesiology trainees' answers regarding the "educational contents/EDAIC" concern.

| Question   | N   | n (%) or Median (IQR) |
|--|-----|-----------------------|
| <b>Do you know the ESA e-learning modules?</b>   | 435 |                       |
| Yes  |     | 141 (32.4%)           |
| <b>Do you know the ESA Refresher Courses?</b>  | 435 |                       |
| Yes  |     | 137 (31.5%)           |
| <b>Rate in terms of importance (1–10) what resources do you find more useful to improve your preparation for the EDAIC.</b>            |     |                       |
| Basic Sciences Anaesthetic Courses   | 432 | 7 (5–8)               |
| Clinical Cases Anaesthetic Courses   | 428 | 7 (6–8)               |
| Multiple Choice Questions Book   | 433 | 7 (6–9)               |
| E-learning Modules   | 429 | 7 (5–9)               |
| Online Preparation Exams (OLA and ITA)   | 427 | 8 (5–9)               |
| <b>Classify in terms of importance (1–10) the necessity to develop the following Topics to improve your preparation for the EDAIC.</b> |     |                       |
| Anaesthesia and Physics  | 433 | 8 (6–9)               |
| Breathing Circuits   | 430 | 7 (6–8)               |
| The Anaesthetic Machine  | 430 | 7 (6–8)               |
| Respiratory Physiology   | 431 | 8 (6–9)               |
| Cardiovascular Physiology  | 429 | 8 (6–9)               |
| Neurophysiology  | 428 | 8 (6–9)               |
| Anaesthesia for the Elderly  | 430 | 7 (6–8)               |
| Anaesthesia and Obstetrics   | 430 | 8 (6–9)               |
| Neuroaxial Anaesthesia   | 429 | 8 (6–9)               |
| Fluid and Electrolyte Management   | 430 | 8 (6–9)               |
| <b>Name one reason why you should undertake the EDAIC Part 1 and 2:</b>  | 353 |                       |
| Improving personal knowledge   |     | 233 (66%)             |
| Part of your national exam   |     | 63 (17.8%)            |
| Life experience  |     | 33 (9.4%)             |
| Because of your institution request  |     | 24 (6.8%)             |
| <b>Name one reason why you will not undertake the EDAIC Part 1 and 2:</b>  | 229 |                       |
| Costs  |     | 126 (55.0%)           |
| Not part of your national exam   |     | 77 (33.6%)            |
| No interest  |     | 14 (6.2%)             |
| No local authorization   |     | 12 (5.2%)             |

#### 4. Discussion

This first European survey of 665 anaesthesia trainees from 32 European and 13 non-European countries, with a completion rate

of 56.4%, revealed the three main concerns of those who completed it are: (1) education, (2) financial issues and (3) employment prospects. The others were: (4) residency workload, (5) exchange programmes, (6) technical skills and (7) autonomy transition. We

**Table 3**  
Anaesthesiology trainees' answers regarding the "residency costs" concern.

| Question   | N   | n (%) or Median (IQR) |
|--|-----|-----------------------|
| <b>Indicate the extent (1–10) to which you were affected by economic reasons to carry out the following activities:</b>    |     |                       |
| National Congresses  | 452 | 6 (3–7)               |
| International Congresses   | 446 | 8 (6–9)               |
| Internships abroad   | 443 | 7 (5–9)               |
| Technical and non-technical skills courses   | 449 | 7 (5–8)               |
| Expenses for books and journals  | 453 | 6 (4–8)               |
| Societies memberships application/renewal  | 453 | 6 (5–8)               |
| Exams fees   | 451 | 6 (4–8)               |
| <b>Do you have financial support from your hospital whenever you are going to present a scientific work at a congress?</b> |     |                       |
| Yes, in parts  |     | 192 (41.8)            |
| Yes, in total  |     | 29 (6.3)              |
| <b>For economic reasons, do you have to give up certain activities/opportunities during your residency?</b>                |     |                       |
| Yes  | 467 | 316 (67.7)            |
| <b>Do you have to do extra-shifts for economic reasons?</b>  |     |                       |
| Yes  | 459 | 268 (58.4)            |

**Table 4**  
Anaesthesiology trainees' answers regarding the "employment prospects" concern.

| Question   | N   | n (%) or Median (IQR) |
|--|-----|-----------------------|
| <b>Are you considering emigrating?</b>                 |     |                       |
| Yes  | 459 | 257 (56.0)            |
| <b>If yes, why?</b>                                    |     |                       |
| Economic   | 268 | 86 (32.1)             |
| Progress in career                                     |     | 83 (31.0)             |
| Life experience  |     | 67 (25.0)             |
| Family   |     | 14 (5.2)              |
| Other  |     | 12 (4.5)              |
| Return to your home country                            |     | 6 (2.2)               |
| <b>If yes, where?</b>                                  |     |                       |
| Northern/Central Europe                                | 257 | 71 (27.6)             |
| Western Europe   |     | 65 (25.3)             |
| Central Europe   |     | 45 (17.5)             |
| Australia  |     | 32 (12.5)             |
| North America  |     | 26 (10.1)             |
| South America  |     | 6 (2.3)               |
| Southern Europe  |     | 5 (1.9)               |
| Asia   |     | 4 (1.6)               |
| Eastern Europe   |     | 3 (1.2)               |
| <b>Rate (1–10) the following "emigration barriers"</b> |     |                       |
| Specialty Recognition Abroad                           | 385 | 6 (3–7)               |
| Bureaucracies  | 385 | 7 (5–8)               |
| Language   | 386 | 5 (3–7)               |
| Local Contact  | 384 | 6 (4–7)               |

will discuss the main three concerns in more detail.

#### 4.1. Education

The European Diploma in Anaesthesiology and Intensive Care (EDAIC) organised by ESA is an increasingly successful exam and some European countries already adopted this exam as their written mandatory national exam [11,20,21]. However, it requires very intensive preparation to achieve a positive result at the high standard set by ESA to be certified at the European level. For instance, 41.5% of the candidates for the part 1 exam (the written part) failed to pass in 2014 [20]. Therefore, the most important concern revealed in our survey is education, namely the preparation for the EDAIC.

On the other hand, surprisingly, most anaesthesiology trainees do not know what ESA already offers for education (e.g. ESA Refresher Courses and e-learning modules), and often developments were requested that already exist in learning resources [22,23]. That means for ESA, an immediate goal could be to improve its communication strategy with and for the trainees. Existing online preparation for the exams is highly appreciated. To meet the

trainees' needs, ESA could also develop other educational resources (e.g. EDAIC multiple choice questions collection booklets or online MCQ quizzes; E-learning Modules in at least ten topics).

In our sample, the anaesthesiology trainees' main fields of interest were intensive care medicine, loco-regional anaesthesia and emergency medicine. Taking that into account could allow improvements to the scientific programmes at conferences and meetings, in order to accommodate the trainees' interests and learning needs leading to more anaesthesiology trainees attending these educational events.

Important further information about why trainees do not take part in the EDAIC is its associated costs. It is not surprising then that financial issues were the anaesthesiology trainees' second main concern.

#### 4.2. Costs

Considering the economic crisis during the last years, "residency costs" are not surprisingly the second highest concern of the anaesthesiology trainees. Besides cost of living in this phase of family building very often associated with a relatively lower salary, participation in educational activities beside the standard formation in their institution is highly challenging for their budget. As the most expensive educational activities, trainees mentioned international congresses, internships abroad, and technical and non-technical skills courses. On the other hand, these educational activities are essential to become a specialist in anaesthesiology [24], because they are a unique opportunity to expand horizons at their own practice, they challenge the trainees' level of knowledge and skills and are also important chances to network [25].

Once again, the main reason for not becoming a member of the ESA was the associated costs, as most of the anaesthesiology trainees are also urged to become members of their national society. Thus, both the aims and memberships of ESA and the national anaesthesia societies need to be developed and promoted effectively [26] to offer attractive combined affiliations to the benefit of the national and European organisations.

Excessive workload is a risk factor for professional burnout and many trainees do extra night shifts for these economic reasons [12]. Until further studies assess how that affects the quality of the residency, one way to alleviate these economic burdens for European trainees could be to reduce the costs to register for the ESA meetings, exams, courses and membership and an easy to access support programme for participating in conferences, residency exchanges or fellowships at institutions abroad. Based on our results, some anaesthesiology departments support their trainees, but the majority only partially. ESA, for instance, provides grants for



internships abroad (Trainee Exchange Programme) [27], registration and travel expenses to do the EDAIC part II (Hypnos Grant) [28], and offers reduced fees for low income countries for membership and registration for conferences [29]. Nevertheless, the financial burden still remains a problem, and the existing approaches to solve that are far from ideal. Therefore, resource allocation was never as important as today.

#### 4.3. Employment prospects

This survey reveals that employment prospects are the third most important concern for anaesthesiology trainees. The strongest motivation to migrate is for economic reasons, followed by personal career possibilities, and the most attractive regions in the world were Northern, Western and Central Europe. We also found that to ease and foster migration in general, an ESA communication platform might be developed where personal experiences can be shared, information regarding each country's legal constraints can be distributed and job opportunities from different countries might be advertised [30]. The ASA Resident Component has developed specific sessions directed to their trainees called "job hunting" which are offered and organised by career experts. Similar sessions could be developed by ESA for their annual Euroanaesthesia meetings.

#### 4.4. Limitations of our survey

The main limitation of our survey concerns the low participation rate (665 anaesthesia trainees), with a completion rate of 56.4%.

An inherent limitation of such surveys is to estimate how representative the population in the survey is. Therefore, not only is it necessary to know the denominator of the entire population being studied, but also to have a high and representative participation rate. The only accessible estimated number of anaesthesia trainees in Europe is 22,082 [15] from 2007.

Regarding the participation rate, by the time of this study there was no available active network among the European trainees, including on social networks. Therefore, we strived to promote the survey in each European country with the aim to obtain a large and representative sample.

Even so, only 665 anaesthesia trainees from 45 different countries initiated the survey, with a participation of a significant proportion of trainees from only 7 countries. One reason for that might be related to the dissemination process of the survey in each country. The authors speculate that not all countries have an active network for anaesthesia trainees such as the GAT in the United Kingdom, which allows the flow of relevant information among trainees.

In our survey the most represented European region was Northern/Central Europe, followed by Southern and Eastern Europe. In order to assess if the distribution of our final sample was consistent with a survey designed to study the anaesthesia workforce in Europe [16], the authors obtained the absolute number of trainees in 33 European countries. When these countries are grouped into three European regions (Northern/Central, Southern and Eastern Europe) using the division we adopted in our survey, we observe the same distribution of European trainees per region [16]. Even though, we found that the four clustered regions were not comparable in terms of the studied demographic characteristics. This result was partly expected, if we consider the inherent social, economic and cultural differences among the European countries.

Regarding the decreasing answer rate along the survey, to assess whether the group of trainees who completed the survey was different from the group that did not, the authors compared both

groups in terms of their demographic characteristics and found that those who completed the survey were younger and comprised ESA-members and Europeans. This difference might be explained by the considerable length and complexity of the survey and the fact that it was directed at the European trainees and promoted by the ESA. The length of the survey was considered necessary to identify the most important concerns from the trainees' perspective and even so, we might have missed other problems of European trainees not addressed in the questions and seven concerns that were selected. Our approach was a pragmatic way to get as much as possible information within the available active network among the European trainees. Nevertheless, future surveys should be more specific and assess a smaller number of concerns.

## 5. Conclusions

Despite the precautions that need to be taken when generalising the results of surveys, we present a first attempt to characterise some of the European anaesthesiology trainees' concerns. Even if the final sample only corresponds to a small portion of the European anaesthesiology trainees, its distribution matches that described in the literature [16]. Out of seven concerns analysed in this survey, the three main concerns are: 1) education, 2) financial issues and 3) employment prospects. Although there were expected differences between European regions regarding their demographic characteristics, the concern with education/EDAIC was the most important for all of them and for the others, even if one concern was not the most important for a specific region, it still remained an important concern. The results of the present survey may provide additional background information for the development of specific improvements in strategies for training in anaesthesiology.

We found that the trainees consider having a European anaesthesiology trainees' network "very important". Such a network could follow up on the developments identified in our survey with the aim to get more information about the needs and educational requests from European anaesthesia trainees.

## Competing interests

No external funding and no competing interests declared.

## Contributions

Below, are the specific contributions to the work from each author:

Diogo Sobreira Fernandes - Designed the survey, participated in the acquisition of data, contributed to the interpretation of data, wrote the paper. Revised the paper critically and approved the submitted version.

Laetitia Teixeira – Did the statistical analysis of all data. Revised the paper critically and approved the submitted version.

Dan Longrois - Designed the survey, participated in the acquisition of data and contributed to the interpretation of data. Revised the paper critically and approved the submitted version.

Michela Rauseo - Contributed to the interpretation of data, wrote and submitted the paper. Revised the paper critically and approved the submitted version.

Mihai Stefan- Contributed to the interpretation of data and wrote the paper. Revised the paper critically and approved the submitted version.

Liana Valeanu - Contributed to the interpretation of data and wrote the paper. Revised the paper critically and approved the submitted version.

Bernardo Matias - Contributed to the interpretation of data and

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Robert Greif - Contributed to the interpretation of data, wrote the paper. Revised the paper critically and approved the submitted version.

Andreas Sandner-Kiesling - Designed the survey, participated in the acquisition of data, contributed to the interpretation of data, wrote the paper. Revised the paper critically and approved the submitted version.

Bazil Ateleanu - Designed the survey and contributed to the interpretation of data. Revised the paper critically and approved the submitted version.

Helmar Bornemann-Ciment- Designed the survey, contributed to the interpretation of data. Revised the paper critically and approved the submitted version.

Paula Sá Couto - Participated in the acquisition of data. Revised the paper critically and approved the submitted version.

Janez Kompan - Participated in the acquisition of data. Revised the paper critically and approved the submitted version.

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### Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.tacc.2018.01.006>.

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