



European School of Oncology – Review

## Changing the education paradigm in oncology: ESO masterclass, 17 years of continuous success<sup>☆</sup>



Nicholas Pavlidis<sup>a,\*</sup>, Pedro Peccatori<sup>b</sup>, Matti Aapro<sup>c</sup>, Christian Rolfo<sup>d</sup>, Andres Cervantes<sup>e</sup>, Rolf Stahel<sup>f</sup>, Alex Eniu<sup>g</sup>, Franco Cavalli<sup>h</sup>, Alberto Costa<sup>i</sup>

<sup>a</sup> University of Ioannina, Career Development Programme, European School of Oncology, Greece

<sup>b</sup> Gynecologic Oncology Department, European Institute of Oncology IRCCS, Milan, Italy

<sup>c</sup> Breast Center, Genolier Cancer Centre, Genolier, Switzerland

<sup>d</sup> University of Maryland and Stewart Greenebaum Comprehensive Cancer Centre, Baltimore, USA

<sup>e</sup> Department of Medical Oncology, Biomedical Research Institute INCLIVA, CIBERONC, University of Valencia, Valencia, Spain

<sup>f</sup> Chair Comprehensive Cancer Centre Zurich, Universitätsklinik Zurich, Zurich, Switzerland

<sup>g</sup> Cancer Institute Prof Dr I. Chiricuta, Cluj-Napoca, Romania

<sup>h</sup> Oncology Institute of Southern Switzerland, Lymphoma Unit-Ospedale San Giovanni, Bellinzona, Switzerland

<sup>i</sup> European School of Oncology, Milan, Italy

### ARTICLE INFO

**Keywords:**

European school of oncology

ESO

Cancer education

Masterclass

### ABSTRACT

In this review, we summarize the history of the 41 Masterclasses in Clinical Oncology (MCO) organized by ESO or ESO-ESMO during the last 17 years. MCOs have been held in five different geographical regions including: a) Central Europe, b) Eastern Europe and Balkans, c) Baltic and Euroasia, d) Arab World and Southern European Countries and e) Latin America. More than 2.000 young oncologists have attended and more than 250 distinguished faculty members have actively participated. The program exposes students to sessions covering all major tumors ("big killers") and to spotlights updating information on various important cancers and related topics. Participants are able to present their own clinical case in front of a tumor board or in parallel group sessions and are evaluated by a Learning Assessment Test (LAT) at the end of the event. They are asked to discuss the programme, using a questionnaire on the goals, quality and organization of the MCOs, which has been very highly scored by most of the participants.

The Masterclass in Clinical Oncology has become the major educational event of ESO, intending to educate young oncologists from various countries within or outside Europe, providing an up-to-date interactive program based on solid evidence for all presented topics.

### 1. Introduction

ESO was established in 1982 in Milan and over the past 37 years has taught thousands of European young oncologists in cancer medicine at more than 1.000 advanced courses, seminars, symposia, conferences or recommended events (Armand et al., 1994; Costa and Gatzemeier, 2001).

ESO's mission is to contribute through education to reduce the number of cancer deaths and to ensure early diagnosis, optimal treatment and holistic patient care. ESO's education is based on the philosophy of "learning to care", where every activity is designed to promote a close and personal interaction between faculty and participants, to help students to develop a critical approach to their practice and to

facilitate the awareness of the need for continual improvement that they should be able to transfer it back to their daily work (Pavlidis et al., 2010). For most of these educational events ESO works in collaboration with ESMO.

In addition to the Masterclasses in Clinical Oncology (MCOs), ESO contributes to the Career Development with the Clinical Training Centres-Fellowship Program, the Certificate of Competence in several tumors, the Online Master Advanced Oncology in co-operation with the University of Ulm as well as with the e-ESO learning program and other activities ([www.eso.net](http://www.eso.net)).

In this article, we are analyzing in details the organization of the five regional ESO MCO or ESO-ESMO MCOs in Clinical Oncology, held yearly at different world geographical areas of Central Europe, Eastern

\* This work has been published on behalf of the European School of Oncology and has not undergone peer-review from the Journal.

\* Corresponding author at: University of Ioannina, Niarchos Avenue, Ioannina 45 000, Greece.

E-mail address: [npavlid@uoi.gr](mailto:npavlid@uoi.gr) (N. Pavlidis).

**Table 1**  
ESO-ESMO Masterclasses in Clinical or Medical Oncology.

1. ESO-ESMO Masterclass in Clinical Oncology (MCO A)
2. ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology (MCO B)
3. ESO Arab and Southern European Countries Masterclass in Clinical Oncology (MCO C)
4. ESO Baltic and Eurasia Masterclass in Clinical Oncology (MCO D)
5. ESO-ESMO Latin America Masterclass in Clinical Oncology (MCO E)

Europe/Balkan countries, Euroasia/Baltic countries, Arab World /Southern European countries and Latin America. Since 2002, 41 MCOs have been organized around the world.

## 2. Materials and methods

### 2.1. MCO definition, aims and objectives

Masterclass in Clinical Oncology is a 5-day residential educational event, providing full immersion in oncology, multidisciplinary and clinically-oriented. It is designed for young medical, radiation and clinical oncologists below the age of 40 years, who wish to improve their skills or to be prepared for the National Boards or the ESMO Examination, but also accepts trainees in surgical oncology. Participants should have at least 2–3 years clinical experience in oncology, preferably with involvement in scientific activities and at least an intermediate level of English. Attendance to MCOs is by application and the process is competitive.

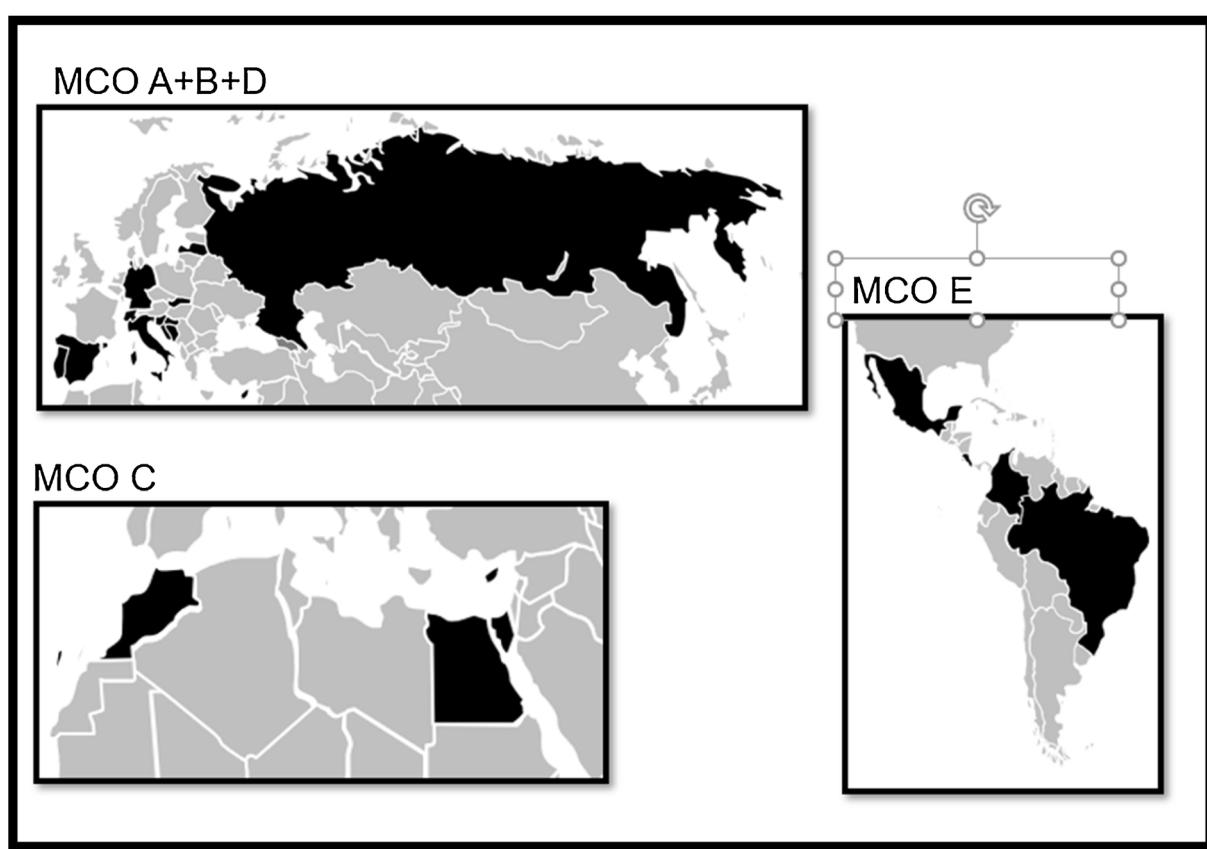
The program exposes participants to a full spectrum of issues in oncology and to practice-oriented training. It focuses on six clinical

**Table 2**  
Masterclass Clinical Programme.

1. **CORE CLINICAL SESSIONS:** on Breast, Lung, Urological, Gastrointestinal, Gynecological and Head and Neck cancers
2. **SPOTLIGHT SESSIONS:** on Melanoma, Sarcomas/GIST, Lymphomas, Brain tumors, Neuroendocrine tumors, Supportive and Palliative care, Geriatric Oncology, Cancer of unknown primary, Biology of Cancer, Statistics, Cancer and Pregnancy/Fertility, Communication skills. etc
3. **SPEAKERS:** 25-40 outstanding speakers (experts) from distinguished European or non- European academic Centers are invited
4. **PARTICIPANTS:** between 40-70 participants are selected for each Masterclass
5. **TUMOR BOARDS (composite of all Session's speakers):** After each Clinical Session a presentation of 3-4 clinical cases provided by the participants is taking place
6. **PARALLEL GROUPS (in charge of one Tutor):** Participants are divided to 3-4 different small groups (of 15-20 participants), where the rest of the clinical cases are presented
7. **LEARNING ASSESSMENT TEST:** On the last day of each Masterclass, a test with 45-50 multiple choice questions on an electronic platform is given
8. **AWARDS :** The participants with the highest scoring test and the 5 best clinical cases presented, are awarded at the end of each Masterclass

sessions on breast, lung, gastrointestinal, urogenital, gynecological and head/neck tumors and it also includes spotlights with updates on various topics i.e. melanoma, sarcomas and GIST, lymphomas, brain tumors, cancer of unknown primary, cancer and pregnancy, cancer in elderly, supportive/palliative care, communication skills, etc.

Five events in different geographical areas including Central, Eastern, Southern and Northern Europe, Arab World and Latin America are taking place annually (Table 1 and Fig. 1).



**Fig. 1.** Countries in all over the world where MCOs have been organized (in black).

MCO-A: ESO-ESMO Masterclass in Clinical Oncology, MCO-B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology, MCO-C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology, MCO-D : ESO Baltic and Euroasia Masterclass in Clinical Oncology, MCO-E : ESO-ESMO Latin America Masterclass in Clinical Oncology

**Table 3**

ESO or ESO-ESMO Masterclasses by City and Countries.

MCO A	MCO B	MCO C	MCO D	MCO E
2002-2018	2010-2018	2007-2018	2014-2018	2015-2018
Montecatini (IT)	Belgrade (RS)	Cairo (EG)	Moscow (RU)	Sao Paolo (BR)
Tenerife (ES)	Dubrovnik (HR)	Amman (JO)	Tbilisi (GE)	Bogota (CO)
Limassol (CY)	Brdo (SI)	Casablanca (MO)	Riga (LV)	San Jose (CR)
St Julians (MT)	Bratislava (SK)	Limassol (CY)		Mexico City (MX)
Sintra (PT)				
Ermatingen (CH)				
Berlin (DE)				

MCO A: ESO-ESMO Masterclass in Clinical Oncology; MCO B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology; MCO C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology; MCO D: ESO Baltic and Euroasia Masterclass in Clinical Oncology; MCO E: ESO-ESMO Latin America Masterclass in Clinical Oncology, In brackets (numbers of events).

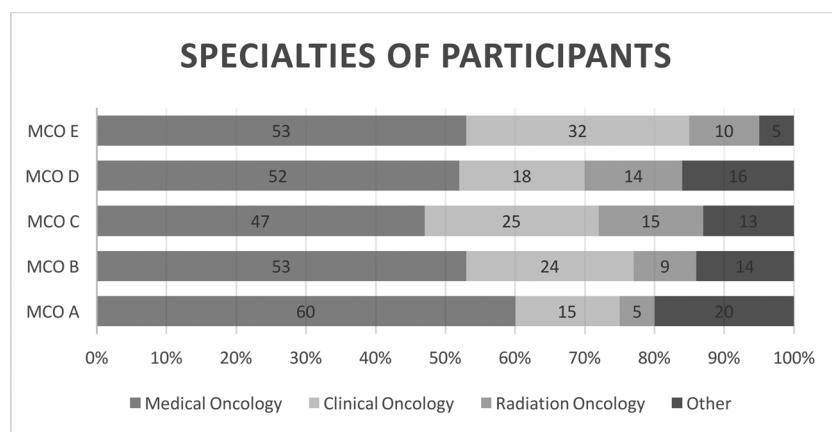
**Table 4**

Demographics of Selected Participants.

	MCO A	MCO B	MCO C	MCO D	MCO E
N. Participants	967	400	299	209	233
Age (Median)	39 yo	35 yo	38 yo	37 yo	36 yo
Gender	M: 46%; F: 54%	M: 38%; F: 62%	M: 45%; F: 55%	M: 36%; F: 64%	M: 49%; F: 51%
Speciality (%)	MO:60%, CO:15%, RO:5%, OTH:20%	MO:53%, CO:24%, RO:9%, OTH:14%	MO:47%, CO:25%, RO:15%, OTH:13%	MO:52%, CO:18%, RO:14%, OTH:16%	MO: 53%, CO:32%, RO:10%, OTH:5%
No Countries	56	30	31	22	14
EU	70%	47%	2%	15%	0,40%
Non-EU	11%	30%	1,50%	51%	0
Non-Europeans	19%	23%	96,50%	34%	99,50%

MCO-A: ESO-ESMO Masterclass in Clinical Oncology; MCO-B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology; MCO-C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology; MCO-D : ESO Baltic and Eurasia Masterclass in Clinical Oncology; MCO-E : ESO-ESMO Latin America Masterclass in Clinical Oncology.

MO : Medical Oncology, CO: Clinical Oncology, RO : Radiation Oncology, OTH : Other Specialties, yo : years-old, EU : European Union, No: number of countries.

**Fig. 2. Specialties in Oncology of all MCO participants.**

MCO-A: ESO-ESMO Masterclass in Clinical Oncology; MCO-B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology; MCO-C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology; MCO-D : ESO Baltic and Eurasia Masterclass in Clinical Oncology; MCO-E : ESO-ESMO Latin America Masterclass in Clinical Oncology.

## 2.2. Teaching format, events evaluation, self assessment test and awards

MCO offers plenary lectures regarding state-of-the-art clinical evaluation and treatment with reference to clinical guidelines, which conclude in take-home messages. The clinical sessions are complemented by the tumor boards (clinical grand rounds style), where selected clinical cases are discussed. The rest of the participants are delivering case presentations within small groups and discuss them with the chairmen and faculty. Some MCOs provide updated developments in managing cancer patients in countries and societies with different cultural and economic conditions, e.g. countries of the Arab world or the Latin America.

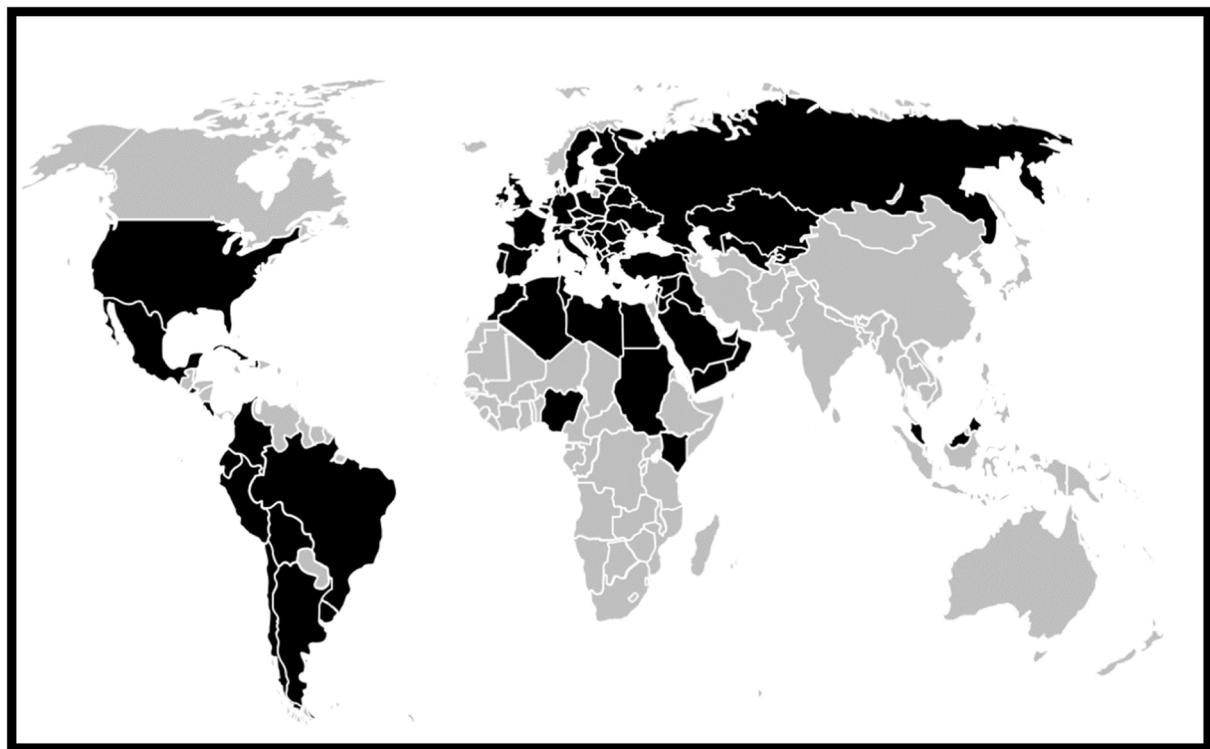
As already mentioned, MCO ends with a Self-Assessment Test (SAT) with 50 multiple choice questions at the end of the event. The six best

case presentations from each clinical session and the first winner with the higher score at SAT are awarded (Table 2).

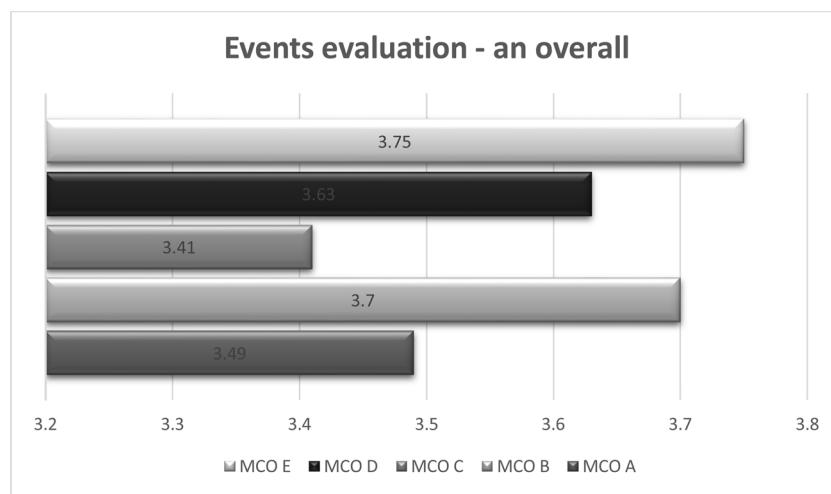
All participants reside at the course venue and participation is compulsory throughout the MCO event. All steps of MCO are evaluated by the participants by completing an evaluation form and scoring each speaker or each clinical case presentation in tumor boards or in parallel group sessions with a scoring system from 1 to 4. In addition, faculty members are evaluating participants' case presentations accordingly

## 2.3. Accreditation

The Accreditation Council of Oncology in Europe (ACOE) and the European Accreditation Council for Continuing Medical Education (EACCME) have acknowledged the quality of the scientific program and



**Fig. 3.** Countries of origin of all participants (in black).



**Fig. 4.** Overall evaluation of core clinical sessions and of case presentations of all five MCOs.

MCO-A: ESO-ESMO Masterclass in Clinical Oncology; MCO-B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology; MCO-C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology; MCO-D : ESO Baltic and Euroasia Masterclass in Clinical Oncology; MCO-E : ESO-ESMO Latin America Masterclass in Clinical Oncology.

its educational value.

ESO-ESMO MCO in Clinical Oncology has been assigned 30 European Continuing Educational Credits (ECMEC) and 25 Category 1 ESMO MORA points. Through an agreement between European Union of Medical Specialties and the American Medical Association, physicians may convert EACCME credits to an equivalent number of AMA PRA Category 1 Credit.

### 3. Results

#### 3.1. Masterclasses' organization

Table 3 demonstrates all ESO or ESO-ESMO organized Masterclasses by city and by country.

#### 3.1.1. ESO-ESMO MCO in clinical oncology (THE Western European Program)

**Venues of MCOs and participants's demographics.** This MCO was initially organized by ESO alone (2002–2008) and since 2009 in collaboration with ESMO. Up to 2018, 17 events have taken place in various European cities/countries namely Montecatini (Italy), Tenerife-Canary Islands (Spain), Limassol (Cyprus), St Julians (Malta), Sintra (Portugal), Sofia (Bulgaria), Ermatingen (Switzerland) and Berlin (Germany).

The total number of participants attending all 17 MCOs is 967, and their mean age 38 years. The proportion of males and females was 46% and 54%. Sixty-per cent were medical oncologists, 15% clinical oncologists, 5% radiation oncologists and 20% from other specialties (Table 4 and Fig. 2).

**Countries of origin.** Participant's countries of origin were mainly

**Table 5**

Evaluation of Core Clinical Sessions and of Case Presentations (Score.1–4)

	MCO A	MCO B	MCO C	MCO D	MCO E	Median
Breast	3.47	3.73	3.48	3.64	3.83	3.63
Lung	5.52	3.70	3.41	3.64	3.80	3.61
Prostate/Bladder	3.45	3.76	3.39	3.58	3.78	3.59
Renal	3.65	3.79	3.49	3.56	3.59	3.61
Ovarian	3.45	3.57	3.45	3.72	3.93	3.62
Uterus	3.30	3.57	3.40	3.67	3.61	3.51
Colorectal	3.58	3.69	3.50	3.65	3.79	3.64
Gastric	3.59	3.76	3.59	3.57	3.93	3.68
Pancreas/Biliary	3.65	3.77	/	3.74	3.84	3.75
Head&Neck	3.47	3.67	3.52	3.74	3.72	3.62
Overall Median						3.62
Cases	3.85	3.50	3.19	3.53	3.73	3.56
Tumour Boards	3.56	3.65	3.41	3.52	3.72	3.57
Overall	3.49	3.70	3.41	3.63	3.75	

MCO-A: ESO-ESMO Masterclass in Clinical Oncology, MCO-B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology, MCO-C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology, MCO-D: ESO Baltic and Euroasia Masterclass in Clinical Oncology, MCO-E: ESO-ESMO Latin America Masterclass in Clinical Oncology.

European countries. In more detail, the represented EU countries were: Italy (11%), Portugal (9%), UK (8.5%), Germany (5%), Belgium (4.5%), Greece (4%), Ireland (3%), Romania (3%), France (2%), Spain (2%), Poland (2%), Bulgaria (1.5%), Netherlands (1.5%), Sweden (1.2%), Hungary (1.2%), Cyprus (0.8%), Slovenia (0.8%), Slovak Republic (0.8%), Austria (0.7%), Czech Republic (0.7%), Finland (0.7%), Denmark (0.7%), Estonia (0.6%), Latvia (0.5%), Lithuania (0.5%) and Malta (0.3%). The rest of the Non-EU or Non-European countries include Switzerland, Russia, Serbia, Georgia, Turkey, Bosnia-Erzegovina, Macedonia, US, Canada, Bahamas, Australia, South Africa, Israel, India, Armenia, Moldova, Malaysia, Iran, Argentina, Uruguay, Brazil, Colombia, Peru, Egypt, Libya, Saudi Arabia, Iraq, Algeria, United Emirates, Qatar, Cameroon, Nigeria and Kenya (Table 4 and Fig. 3).

### 3.1.2. ESO-ESMO Eastern Europe /Balkans MCO in clinical oncology

**Venues of MCOs and participant's demographics.** Between 2011 and 2018 eight ESO MCOs were held. Between 2014–2018, 5 MCOs were organized in a joint venture with ESMO devoted to Medical Oncology. In total, eight MCOs were organized three of them in Dubrovnik (Croatia), two in Belgrade (Serbia), two in Bratislava (Slovakia) and one in Brdo (Slovenia). The total number of participants were 400 with a mean age of 35 years old. The ratio of males to females was 38%–62%. Fifty-three percent were medical oncologists, 24% clinical oncologists, 9% radiation oncologists and 14% other specialties (Table 4 and Fig. 2)

**Countries of origin.** The countries of origin of all participants were

mainly from Balkan countries, a few from other Western European countries and very few from non-European countries. In more details, the participating countries were: Romania (20%), Serbia (16%), Slovenia (10%), Albania (7%), Bosnia-Herzegovina (5%), Bulgaria (6%), Greece (6%), Poland (4%), Slovak Republic (3.5%), Croatia (3%), Russia (3%), Hungary (2%), Montenegro (2%), Macedonia (2%), Czech Republic (2%), Turkey (1.4%), Estonia (1%), Latvia (1%), UK (1%), Ukraine (1%), Switzerland (0.5%), Sweden (0.5%), Portugal (0.5%), USA (0.5%), Kosovo (0.3%), Moldova (0.3%) and Tunisia (0.3%) (Table 4 and Fig. 3).

### 3.1.3. ESO EURASIA/BALTIC REGION MCO IN CLINICAL ONCOLOGY

**Venues of MCOs and participant's demographics.** Since 2014, five ESO MCOs took place in Moscow (Russia Federation), Tbilisi (Georgia) and Riga (Latvia). The total number of participants were 209 with a mean age of 37 years old. The gender ratio of males to females was 36%–64%. Fifty-two percent were medical oncologists, 18% radiation oncologists, 14% clinical oncologists and 16% other specialties (Table 4 and Fig. 2).

**Countries of origin.** Eighty-five percent of participants were originated from Euroasia and Baltic countries and the rest from European Union countries. Twenty-seven per cent were from Georgia, 17% from Russia, 7% from Uzbekistan, 6% from Romania, 5.5% from Belarus, 4% each from Armenia, Kazakhstan, Ukraine, Serbia and UK, 3% each from Estonia and Turkey, 2% each from Bulgaria and Latvia, 1.5% each from Albania and Croatia and 0.8% each from Kirghizistan, Lithuania, Poland, Moldova and Macedonia (Table 4 and Fig. 3)

### 3.1.4. ESO Arab world/southern Europe MCO in clinical oncology

**Venues of MCOs and participant's demographics.** Between 2007 and 2018, seven ESO events were held in the region, 5 in Middle East and 2 in Cyprus. The host cities in Middle East region were Cairo (Egypt), Amman (Jordan) and Casablanca (Morocco) and in the Southern European region was Limasol (Cyprus). The total number of selected participants was 299 with a mean age of 38 years old. Males to females sex ratio was 45%–55%. Forty-seven percent were medical oncologists, 15% radiation oncologists, 25% clinical oncologists and 13% other specialties (Table 4 and Fig. 4).

**Countries of origin.** The countries of origin of most participants were mainly from Middle East predominantly from Egypt, whereas more applications from Southern European countries were observed in the Limasol MCOs. The distribution of participated countries was as follows: Egypt (44%), Morocco (7%), Lebanon (5%), Jordan (5%), Libya (4%), Sudan (3%), Iraq (3%), Algeria (3%), Turkey (3%), Syria (2%), Saudi Arabia (2%), Palestine (2%), Tunisia (2%), Oman (1.2%), Yemen (0.6%), Bahrain (0.6%), Nigeria (0.6%), United Emirates (0.3%), Kuwait (0.3%), Albania (0.3%), Island (0.3%), USA (0.3%), UK (0.3%), Malaysia (0.3%), Italy (0.3%), Montenegro (0.3%), Portugal (0.3%), Hungary (0.3%), Serbia (0.3%), Ukraine (0.3%) and Kenya (0.3%) (Table 4 and Fig. 3)

**Table 6**

Analysis of Questionnaire Evaluation : "Strongly Agree" (% mean values).

Question	MCO A	MCO B	MCO C	MCO D	MCO E	Median
Did the meeting provide the goals and learning outcomes?	85%	77%	64%	76%	90%	78%
Please give an overall rating for the quality of the education offered at this meeting	82%	79%	66%	77%	86%	78%
Was the information useful and relevant to your work and practice?	79%	68%	64%	68%	81%	72%
Did you feel that the presented information was well balanced and supported with adequate evidence?	76%	77%	69%	74%	77%	75%
Did the program allow adequate time for discussion and questions?	70%	62%	57%	63%	32%	57%
How would you rate the organization, management, facilities and venue for the purpose of the meeting?	89%	91%	68%	90%	69%	82%
Overall	80%	73%	65%	75%	73%	74%

MCO-A: ESO-ESMO Masterclass in Clinical Oncology, MCO-B: ESO-ESMO Eastern Europe and Balkan Region Masterclass in Medical Oncology, MCO-C: ESO Arab and Southern European Countries Masterclass in Clinical Oncology, MCO-D: ESO Baltic and Euroasia Masterclass in Clinical Oncology, MCO-E: ESO-ESMO Latin America Masterclass in Clinical Oncology.

### 3.1.5. ESO-ESMO Latin America MCO in clinical oncology

**Venues of MCOs and participant's demographics.** Four ESO-ESMO MCOs were organized in Latin America from 2015 to 2018. One in São Paulo (Brazil), one in Bogota (Colombia), one in San José (Costa Rica) and one in New Mexico (Mexico). The total number of selected participants was 233 with a mean age of 36 years old. Males to females ratio was 49% to 51%. Fifty-three per cent were medical oncologists, 32% clinical oncologists, 10% radiation oncologists and 5% other specialties (Table 4 and Fig. 2).

**Countries of origin.** The countries of origin of all participants were almost exclusively from Latin American countries namely, Brazil (44%), Mexico (17%), Peru (9%), Costa Rica (7%), Argentina (5%), Colombia (5%), Cuba (4%), Chile (3%), El Salvador (2%), Bolivia (1%), Ecuador (0.5%), Haiti (0.5%) and Uruguay (0.5%). One participant was from Portugal (0.5%) (Table 4 and Fig. 3).

### 3.2. Masterclasses' evaluation

#### 3.2.1. Evaluation of core clinical sessions and of clinical case presentations (score 1–4)

Evaluation of clinical sessions and of clinical case presentations (tumor boards and parallel small groups) by the participants is summarized in Table 5.

It is evident that almost all core sessions were as well as tumor boards and small parallel groups were highly valued, with a median overall scoring of 3.62, 3.57 and 3.56, respectively.

#### 3.2.2. General evaluation questionnaire

Six most important questions regarding the goals, the quality and the organization of MCOs were analyzed. Answers to each question was stratified as follows: a) strongly agree, b) agree, c) neutral, d) disagree and e) strongly disagree. It should be emphasized that in the present questionnaire analysis, only the first step ("strongly agree") was taken into consideration (Table 6).

The median scoring of most questions was quite high except the question number 5 ["*did the program allow adequate time for discussion and questions?*"] which was scored relatively low. This should be attributed to the density of the educational program that it regrettably doesn't allow enough additional time for discussion.

## 4. Discussion

Oncology remains one of the most multidisciplinary areas of medicine, as most cancer patients receive therapy with various modalities during the course of their disease.

Today, there is a worldwide need for greater access to cancer education for health professionals in oncology, due to the continuing biomedical advances in cancer care, to the increasing new cancer cases (>30% by 2030) and to the substantial presence of cancer survivors (Cave, 2016; Shanafelt et al., 2014).

MCO is a platform for teaching and sharing ideas with a group of selected participants. It is taught by a Master (an Instructor) of a particular discipline with adequate knowledge, experience and charisma. MCO is constructed to follow five major principles :i) acknowledging and sharing with the audience, ii) understanding the needs of the students, iii) having something interesting to deliver, iv) ability of communicating and v)entertaining the audience with a winning and appealing touch.

The ESO or the ESO-ESMO MCO are rewarding interactive events with state of the art lectures and clinical case presentations. Interaction is a major aspect where the faculty is encouraging to stimulate discussion and feed-back with the audience. It intends also to provide participants with a comprehensive update on the latest oncology progress, useful for decision making in their daily practice. In addition, sessions on communications skills and on attitudes towards disclosure of medical information are offered in certain MCOs (Pavlidis et al.,

2010).

Due to the pressing need for young oncologists to keep up with new advances in cancer medicine, several cancer societies such as ESTRO, ESSO or SIOPE have organized in addition various educational courses (Eriksen et al., 2016; Kolacinska, 2017) and ESO collaborates with many for some events ([www.eso.net](http://www.eso.net)). ESMO has developed further activities, including the ESMO academy for professionals who intend to take the ESMO Examination, medical oncologists in training and professionals in need of a refresher course and ESMO preceptorships designed primarily for young medical and clinical oncologists wishing to update their knowledge on specific topics (Vassal et al., 2015; Morgan et al., 2016; Pavlidis et al., 2015; Faivre et al., 2018).

Since 2009 a Masterclass in Oncology Nursing has been organized along with the Masterclass for Clinical Oncology in a multi -professional joint event. It is also a 5- intensive days of full immersion educational event, aiming to create a collective spirit of teaching and learning to improving clinical skills and patient care. Special joint sessions, together with physicians are supporting the growing need for multi-professionalism in chosen topics. In addition, practical training is offered in smaller group sessions with case study sessions focusing on skills necessary for patient care management. This Masterclass aims to prepare oncology nurses for future senior roles and enhance their clinical knowledge in the management of the cancer patient during all phases of the cancer journey.

At this point, it is interesting to refer to the undergraduate oncological education status within European Medical Schools and the need for teaching integration. Due to fact that undergraduate cancer education is underemphasized and fragmented, both ESO and ESMO have decided to offer extra-curriculum oncology teaching to 4<sup>th</sup> and 5<sup>th</sup> medical students. Since 2004, sixteen 5-days emerging courses have been organized by the Universities of Ioannina, Valencia and Naples, where more than 800 medical students have attended (Pavlidis et al., 2007, 2012; Pavlidis et al., 2005).

Since 2002 ESO MCO is considered as the "key event" of the School designed for medical, clinical and radiation oncologists. Up to 2018, totally 42 MCOs have taken place in Europe, Middle East and Latin America, where 2.108 young oncologists have been participated. Among them 53% were medical oncologists, 23% clinical oncologists and 11% radiation oncologists. Western and Eastern European as well as Balkan MCOs hosted the highest number of EU attendees, whereas Arab and Latin America MCOs have been mainly populated by Arab or Latin American oncologists.

Evaluation of all MCOs by the majority of participants have demonstrated very encouraging results. Core clinical sessions have been highly scored (3.53–3.75), while 78% (72%–82%) of the participants have "strongly agreed" with the questionnaire given. On the contrary, question number 5 ["*did the program allow adequate time for discussion and questions?*"] has received a score of 57% (13%–85%), probably due to a packed program that didn't permit an adequate time for discussion, but one should note that the "full immersion" nature of the course allows for interaction of the faculty with participants at breakfast, lunch break and dinner. Both clinical case interactive sessions (tumor boards and parallel small groups) have also been highly perceived (Tables 5 and 6).

ESO intends to continue annually all five regional MCOs, in order to provide worldwide junior oncologists the opportunity to keep up with current advances in oncology and to try to prepare them for their National Boards or ESMO examination.

In conclusion, during the last 17 years ESO in part in collaboration with ESMO is playing a key role in cancer education for young doctors in Western, Eastern and Southern Europe as well as in Middle East and Latin America.

### Acknowledgements

We would like to thank all event organizers (in alphabetic order) Mrs Ciocchini Alice, Knupfer Dolores, Marangoni Francesca, Mengato

Daniela and Mr Carvalho Luis for their valuable and continuous contribution in the successful organization and management of ESO Masterclasses

## References

Armand, J.P., Alberto, P., Costa, A., Estape, J., et al., 1994. European School of Oncology Advisory Report to the Commission of the European Communities for the "Europe Against Cancer Programme." Continuing Medical Education in Oncology within the European Union. *Eur. J. Cancer* 30A (8), 1145–1148.

Cave, J., 2016. Oncology and medical education-past, present and future. *Ecancer* 10 ed54 DOI:10.3332.

Costa, A., Gatzemeier, W., 2001. European School of Oncology: 20 years of cancer education and a contribution to European Guidelines of Oncology. *Surg. Oncol. Clin. N. Am.* 10 (4), 781–794 viii.

Eriksen, J.G., Leech, M., Benstead, K., Verfaillie, C., 2016. Perspectives on medical education in radiation oncology and the ESTRO School. *Clin. Transl. Radiat. Oncol.* 1, 15–18.

Faivre, J.C., Bilbault, J.E., Bellsoeur, A., Salleron, J., et al., 2018. Choosing a career in oncology: results of a nationwide cross-sectional study. *BMC Med. Educ.* 18 (15), 1–9.

Kolacinska, A., 2017. How can we improve education of breast surgeons across Europe? *Chirurgia (Bucur)* 112 (4), 365–366.

Morgan, G., Lambertini, M., Kourie, H.R., Amaral, T., et al., 2016. Career opportunities and benefits for young oncologists in the European Society for Medical Oncology (ESMO). *ESMO Open* 1, e000107.

Pavlidis, N., Gatzemeier, W., Popescu, R., Stahel, R., Pinedo, H., Cavalli, F., Costa, A., 2010. The Masterclass of the European School of Oncology: the "key educational event" of the school. *Eur. J. Cancer* 46 (12), 2159–2165.

Pavlidis, N., Alba, E., Berardi, R., Bergh, J., et al., 2015. The ESMO/ASCO Global Curriculum and the evolution of medical oncology training in Europe. *ESMO Open* 1, e000004.

Pavlidis, N., Vermorken, J., Stahel, R., Bernier, J., et al., 2007. Oncology for medical students: a European School of Oncology contribution to undergraduate cancer education. *Cancer Treat. Rev.* 33, 419–426.

Pavlidis, N., Vermorken, J.B., Stahel, R., Bernier, J., et al., 2012. Undergraduating training in Oncology: an ESO continuing challenge for medical students. *Surg. Oncol.* 21 (1), 15–21.

Pavlidis, N., Vermorken, J.B., Costa, A., 2005. Oncology for medical students: a new ESO educational avenue. *Ann. Oncol.* 16 (5), 840–841.

Shanafelt, T.D., Raymond, M., Horn, L., Moynihan, T., et al., 2014. Oncology Fellows Career Plans, Expectations and Well-Being: Do Fellows know what they are getting into? *J. Clin. Oncol.* 32 (27), 2991–2997.

Vassal, G., Landman-Parker, J., Baruchel, A., et al., 2015. Multidisciplinary education and training in Pediatric Oncology-Hematology. *Arch. Pediatr* 22 (12), 1217–1222.