



Online Survey Evaluation of Three Years of European Society of Thoracic Surgeons Educational Webinars as Part of The E-learning Platform

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Abstract

Background E-learning has become an important tool in surgical education in the last decade. The European Society of Thoracic Surgeons launched its e-learning platform in 2013 and started its educational webinars series in 2018. The aim of this paper is to discuss the introduction, evolution and impact of the educational webinars within this e-learning platform.

Methods Twenty-four English spoken webinars discussing different subdomains in general thoracic surgery (21 expert talks, 2 pro-con debates and 1 multidisciplinary case discussion) were analyzed. An online questionnaire on timing, quality and technical aspects of the webinars was sent to 3012 registrants.

Results The webinars reached 3128 unique registrants from 76 countries worldwide. The mean number of registrants was 355 with 171 live attendees (48%) and 155 replay watchers (36%). Hundred and twenty-six attendees (13.1% of people who registered for at least 4 webinars) completed the questionnaire. Timing and duration of the webinars were rated “very good” to “excellent” in 78%, and the quality of the webinar content and the expertise of the webinar presenters were rated “very good” to “excellent” in 88% and 90%, respectively. The impact on knowledge and clinical practice was scored with a weighted average of 7.27 out of 10 and 6.79 out of 10, respectively.

Conclusions The ESTS educational webinars were effective in delivering up-to-date knowledge to almost half of the countries around the globe. The impact of these events on knowledge and clinical practice were rated high. New e-learning tools should be added to the surgical educational curriculum.

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Introduction

Surgical education has dramatically changed over the past 20 years, due to advancing technology, restricted working hours and the awareness that education is more than teaching knowledge and skills alone [1]. Nowadays—and especially in a period of uncertain travel and physical gathering possibilities due to COVID-19 waves worldwide—e-learning has rapidly gained importance and sometimes seems to be the only certainty left in educational programs worldwide [2].

Also the European Society of Thoracic Surgeons (ESTS) has regularly refined and further developed its educational platform over the last 15 years [3] and launched an educational webinar series in 2018: In 2013, Alex Brunelli, Secretary General of the Society at that time, proposed the current mission of ESTS which was approved by the Board: *“to improve quality in all aspects of our specialty: from clinical and surgical management of patients to education, training and credentialing of thoracic surgeons in Europe and worldwide”* [4]. As a contribution to this mission, the ESTS had launched its educational platform in 2006 [5] with two main goals: to prepare trainees for the European Board of Thoracic Surgery examination and to offer continuous educational opportunities to certified thoracic surgeons.

In 2013, the ESTS launched the idea of an e-learning platform, adding extra learning material to the knowledge and skills tracks [3]. After the success of the first live educational webinar in 2017, the ESTS learning affairs committee decided to create a series of educational webinars on different topics in general thoracic surgery.

The aim of this paper is to discuss the introduction, evolution and impact of the educational webinars within this e-learning platform until today, but also to discuss future needs and potential solutions for the next era of general thoracic surgery education.

Methods

The development of the e-learning platform

Together with the launch of the ESTS educational platform in 2006, a knowledge track and skills track were created [5]. They were part of the core training of many practicing general thoracic surgeons in Europe and beyond. Knowledge track included ESTS School of Thoracic Surgery and skills track included wet and dry laboratory events, and workshops. The meetings and training sessions in Antalya and Elancourt became “the standard” as the core training for general thoracic surgical trainees in preparation of the European Board of thoracic surgery examination. An

academic competence track, which included medical writing course and a business/management course were later added to the other two tracks. From 2013 on, the e-learning platform was created to offer additional and complementary learning material beside the aforementioned 3 tracks [3]. Within the ESTS learning affairs committee, the director of education is assisted by four coordinators (knowledge, skills, academic competence and e-learning) and a junior representative.

The original idea for the e-learning platform was to start with a digital library based on the content of a digital version of the ESTS textbook [6], educational sessions from the annual conference and surgical video clips. It took several years before it became fully operational. Currently the content is freely accessible for all ESTS members [https://www.ests.org/educational_activities/online_educational_resources.aspx] [7].

In the meantime, two other particularly important initiatives within the e-learning platform were conceived: The first one was the Harmonized Education in Respiratory Medicine for European Specialists (HERMES) in collaboration with the European Respiratory Society [8]. This task force developed a complete training curriculum for thoracic surgeons, going further beyond knowledge and skills, but also implementing non-technical skills and professional attitudes, necessary for a general thoracic surgeon practicing in Europe.

The second initiative was the organization of the first live ESTS educational webinar on November 9th, 2017, on “enhanced recovery after thoracic surgery” with an attendance of more than 300 participants. The moderator and experts were live in a studio in Paris and the audience could virtually watch and interact from all over the world. Given the success of the webinar, the ESTS learning affairs committee decided to start a webinar series for thoracic surgeons during the next academic year.

Ethical statement

This research was in accordance with the latest version of the Declaration of Helsinki. Webinar registrants agreed with storage and use of their personal data for scientific purpose upon subscription in accordance with the EU Regulation 2016/679 (General Data protection Regulation). Therefore, further need for informed consent was waived.

Methods

All ESTS educational webinars and corresponding data between October 2018 and May 2021 were summarized and described per season. A questionnaire was designed by the ESTS learning affairs committee in several rounds between April 2020 and April 2021 to evaluate the

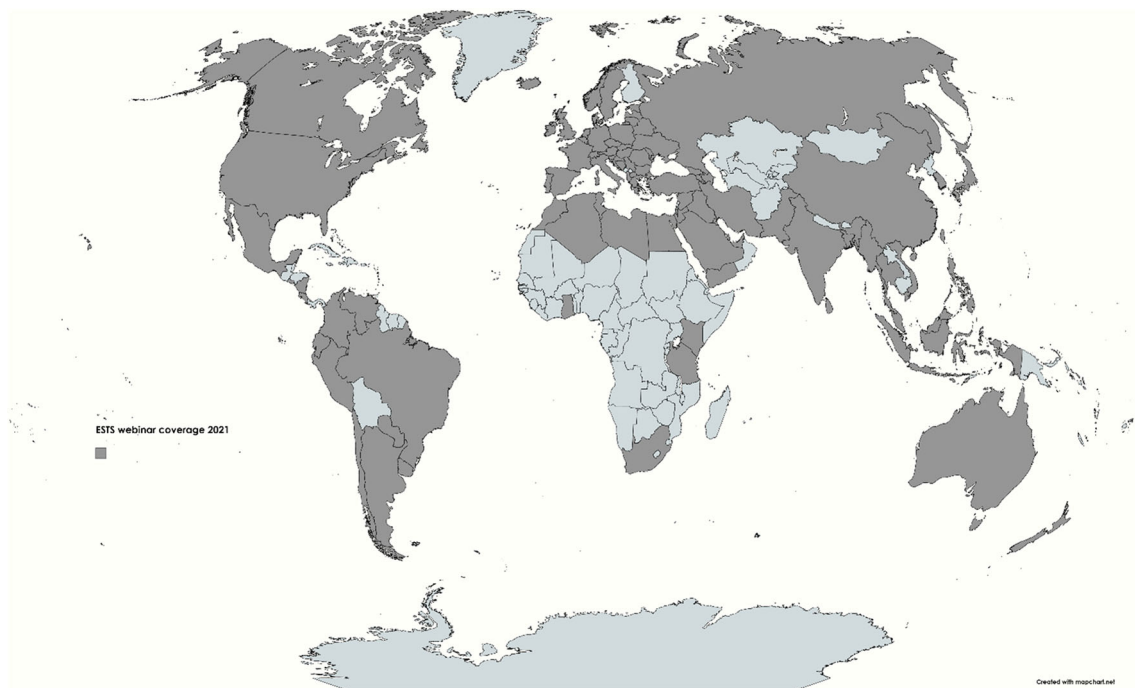


Fig. 1 Worldwide ESTS educational webinar coverage in May 2021

educational webinars. The questionnaire was consisting of 30 questions: 6 demographic questions, 5 questions on timing, 4 on content, 4 on people, 2 on format, 4 on access and 5 on the overall experience [appendix 1]. In total, 3012 registrants were invited to complete the questionnaire available on *surveymonkey.com* from September 27, 2021, to November 1, 2021. No reminders were sent.

Statistical analysis

Webinar data were presented as means with range between minimal and maximal values between brackets.

Different response proportions to a survey question were described as a percentage of the total responses. Questions 13,14,15,17, 23, 24, 28, 29 and 30 were designed to answer on a Likert scale from 0 to 10. The percentage of survey participants was displayed per chosen value between 0 and 10. Weighted average in these questions was calculated as the mean value after each individual value was multiplied by its percentual weight.

Results

The first ESTS educational webinar season started in October 2018 with 8 webinars (monthly) until May 2019. All webinars were English spoken expert talks on a specific topic in the general thoracic surgical domain, with interaction with the audience through multiple choice poll

questions asked by the expert and live chat questions answered by the expert. Total duration was 60 min. The moderator was always the same person appointed by the learning affairs committee. During the next season (2019–2020), accreditation points by the European Accreditation Council for Continuing Medical Education (EACCME) were allotted. During the 2020–2021 season, two new and even more interactive webinar types were introduced to the program, namely 2 pro/con debates and 1 multidisciplinary discussion, in addition to classical expert lectures with multiple choice poll questions [5]. Over this 3-year period, 3128 unique accounts for these webinars were registered in 76 countries worldwide, covering all continents (Fig. 1). Data are summarized in Table 1.

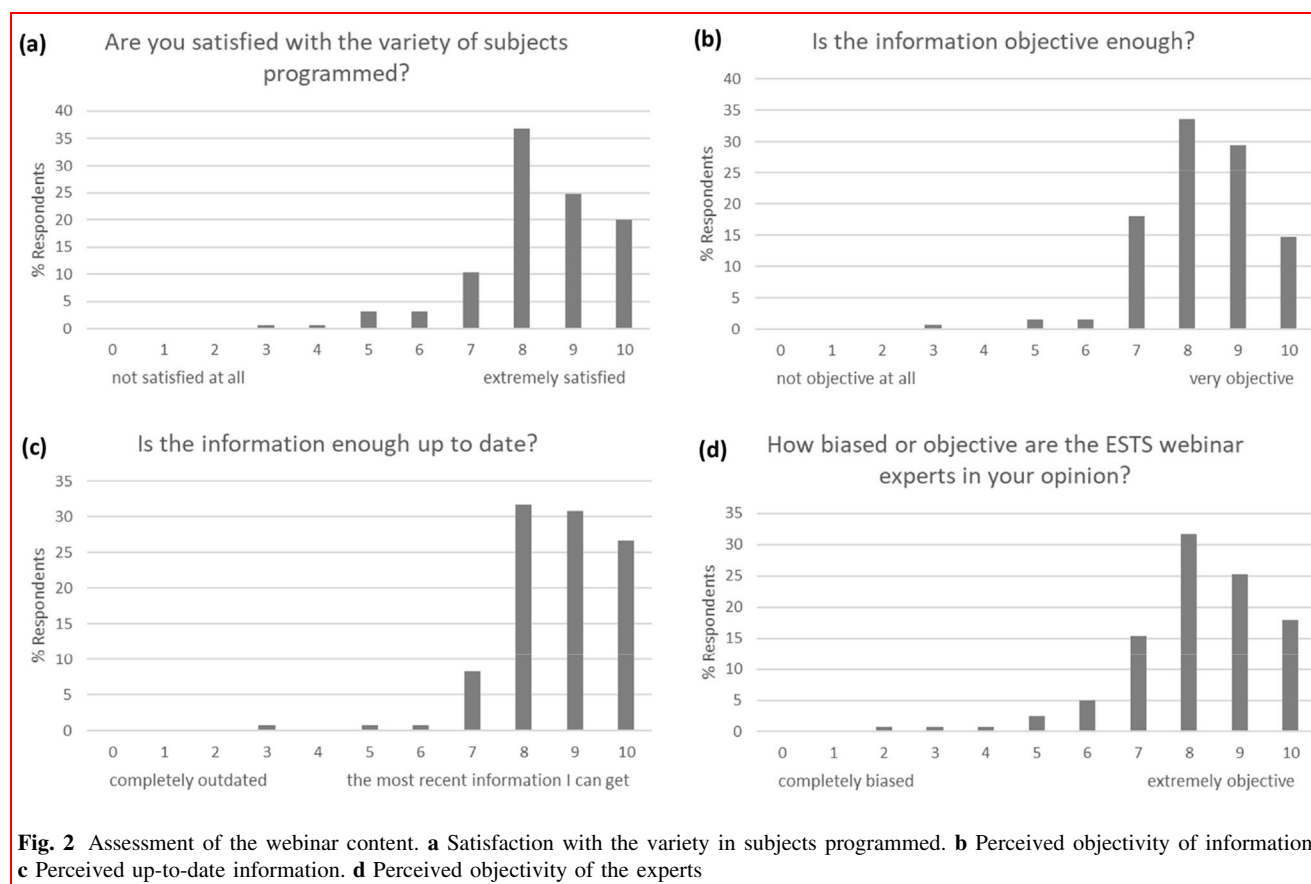
Hundred and twenty-six (4.2% of all registrants and 13.1% of people who registered for at least 4 webinars [962 registrants]) completed questionnaires (100% completeness rate) from 24 different countries were received (no responses from North America and Australasia). Eighty percent of the respondents were male and 75 percent were between 35 and 55 years old. Eighty-four percent had a thoracic surgery background training and 65% was working in an academic hospital. Almost one in seven (13.5%) respondents was still in training.

Timing and duration of the webinars was rated “very good” to “excellent” in 78%, “good” in 18% and “fair” to “poor” in 4%. The preferred yearly number of webinars differed among respondents ranging between 4 and 12 webinars per year.

Table 1 Webinar data

Season	Webinars	Registrants	Live attendees	%	Replay watchers	%	EACCME credits	% EACCME credits
2018–2019	8	194 (114–274)	90 (48–142)	46	72 (35–98)	37	n.a	n.a
2019–2020	8	246 (135–417)	112 (53–184)	46	182 (115–288)	37	47 (23–69)	42
2020–2021	8	624 (274–888)	312 (128–486)	50	210 (99–365)	35	148 (58–258)	47
2018–2021	24	355 (114–888)	171 (48–486)	48	155 (35–365)	36	98 (23–258)	46

EACCME European accreditation council for continuing medical education



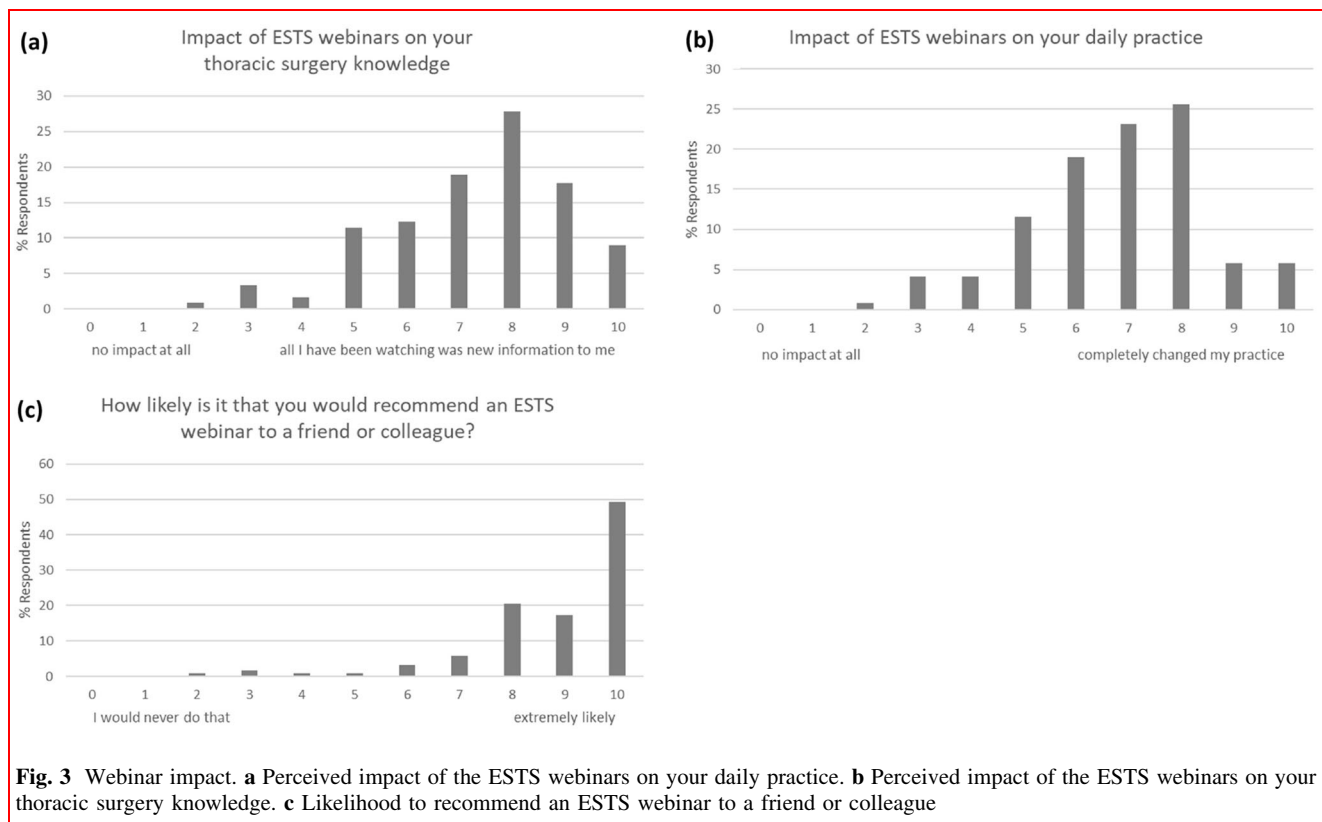
Also, the preferred day of the week was not consistent among respondents. Only Monday and Friday showed a marginally higher preference with 21% of the respondents each. Regarding the ideal time of the day, the preference was 6PM Central European Time (29%) with 87% between 4 and 8PM CET. More than half of the respondents (56%) were in favor of 60-min webinar duration.

The quality of the webinar content and the quality of the webinar experts were rated “very good” to “excellent” in 88% and 90%, respectively. More detailed assessment is shown in Fig. 2 with a weighted average (on 10) of 8.31 for satisfaction with the variety in subjects programmed, 8.29 for the objectivity of information, 8.68 for up-to-date information and 8.16 for the objectivity of the experts.

There was enough geographical spread among experts and institutions according to 76% of the respondents while 70% of the respondents was satisfied with the host/moderator. The current format of expert talks/cases, multiple choice question polls and discussion was rated “very good” to “excellent” in 78% and “good” in 17%. Eighty percent of the respondents was watching live at most of the webinars.

The information about the webinars reached the respondents through the ESTS website (60%), email (56%), social media (15%) and/or colleague/friend (10%).

The self-perceived impact of the webinars on thoracic surgery knowledge and clinical practice was significant for the majority of the respondents with a weighted average of 7.27 and 6.79 in a scale from 0 to 10, respectively, and the



likelihood that a respondent would recommend an ESTS webinar to a friend or colleague was 8.84 out of 10 (Fig. 3).

Discussion

Since the launch of the ESTS educational platform 15 years ago, thoracic surgical education has changed dramatically [9]. E-learning, apart from simulation, has become an important part of the training during the last years, especially enhanced by the current COVID-19 pandemic [10–12]. The introduction of the educational webinar series in 2018 was a key step in adapting to new tools of e-learning and has been evaluated after 3 seasons.

With a mean of 355 registrants and 47% live attendees, the webinars reached a global coverage. However, most of the African continent and Western Asian countries were not reached. Whether this is because of limited promotion in these countries, more difficult internet connectivity, language barrier or webinar subjects not applicable in the local context, cannot be deduced from these data, but a specific survey in these countries could possibly answer these questions.

Despite a high number of competing webinars and virtual meetings during the COVID-19 pandemic, it was remarkable during the last season (2020–2021) that we reached the highest subscription and attendance rates. The

so-called webinar fatigue, caused by the overwhelming number of e-learning events, did not appear to affect these webinars [13, 14]. This could be partially explained by the CME credit points that could be earned, which is a known external motivational aspect [14–16].

The evaluation of the webinar series by the users has the limitation of a low (4.2%) response rate. However, looking into detail to the respondents of the questionnaire we found that only people who registered 4 times or more for one of the 24 webinars (962 people) actually responded. This means a response rate of 13.1% avoiding bias of people who only registered for one or a few webinars in our series, not being able to give a correct appreciation of the full series. Unfortunately, other potential bias inherent to a low response rate could not be avoided. In order to overcome this low response rate in the future, a feedback form is currently sent out to participants after each webinar and certificates of attendance or credit points are only provided after completion of the form. This was already a standard procedure after the yearly conferences, but has now been extended to the webinars as well. The lack of true global coverage also results in a considerable risk of potential bias. Nevertheless, the questions on timing and quality are truly relevant, since “content” is the most commonly reported factor for webinar attendance and “timing” was the most common factor for declining webinar attendance in earlier publications [14, 15]. Regarding timing, the

current 60-min webinars on 6 pm CET were found to be very good to excellent in the vast majority of responses and comparable with earlier findings [17]—again mentioning that important time zones from north America and Australasia were not represented in the responses, but there was more controversy on the preferred day of broadcasting and the frequency of yearly webinars. Indeed, a recent report by ON24® [18] mentioned that Thursday would be the most appropriate day, followed by Wednesday and Tuesday, while in the ESTS questionnaire Friday and Monday were the preferred days of the week, followed by Saturday. This could probably be explained by the fact that thoracic surgeons have different working schedules than the average webinar user. Although we offered the possibility to watch a replay of the webinar, only about one in three webinar registrants used this option, once again underlining the importance of the scheduled live session.

The webinars were largely conceived according to current webinar recommendations [14, 19] resulting in a high satisfaction rate for the vast majority of respondents, regarding quality of content, quality of speakers and format. However, the most important quality parameter in our opinion (although this is a subjective parameter) is the impact of the webinars on knowledge and—even more importantly—on clinical practice. Like in other medical branches, the accreditation focus is moving from process assessment to outcome assessment [20]. The subjective impact the ESTS educational webinars on clinical practice was less than the subjective impact on knowledge. Indeed, the objective impact of continuing education meetings on clinical practice is rather low, according to a recently updated Cochrane systematic review [21].

Therefore, future e-learning initiatives should focus on the difficult balance between timing, interaction, accurate information and adequate assessment in order to have impact [9]. Just as most surgeons did not believe that e-learning would be able to replace the classical analogue education, some of today's surgeons are skeptical regarding the use of social media in surgical education [22, 23]. However, the trend toward e-learning is unstoppable and social media are already being used in thoracic surgery communities: Journals bring their published articles to social media to have more and faster spread [24] and virtual journal clubs are discussing these papers [25]. Both are examples where the accuracy of information has been checked and peer-reviewed. Besides knowledge and

operative skills transfer, social media also play a vital role in networking and further career advancement [26], which can also be classified under the education umbrella. Furthermore, e-learning events and social media have the potential advantage of reaching surgeons and trainees who are not able to travel for several reasons (cost, visa barriers, institutional policies, clinical activities). The cornerstone in this debate will probably be the input of trainees since one in seven respondents in this questionnaire was a trainee and the webinars are, unlike other ESTS educational resources, not specifically designed for trainees [27]. Anyhow, the use of modern technology should always be evaluated in a scientific context [28, 29], but optimizing social media dissemination and facilitating access to the recorded videos may already further enhance the global audience of the current webinars.

Conclusion

The educational webinars of the European Society of Thoracic Surgeons were the logical further step in the evolution of the e-learning platform. They grew to an important level, underwent a thorough assessment after 3 years and were approved by peer review. Based on the results of the current survey we believe e-learning will continue to represent a valuable supplement to traditional in-person education. It will allow to engage more experts in the fields and reach a more global audience in a sustainable way for the Society and for the attendees. It will also ensure that the educational offer will be quickly adapted in a flexible manner to respond to the thoracic community needs. The final aim of adding e-learning to the organizational educational portfolio is to provide a balanced educational program which would be inclusive, comprehensive and representing best practice in order to reduce global variability of thoracic surgical care and improve quality of care in keeping with the mission statement of our organization.

The next steps in thoracic surgery e-learning should be taken after well considered planning by the learning affairs committee by defining clear learning objectives for all the ESTS educational webinar series and timely evaluation of the impact will be important.

Appendix 1: Survey questions

- 1 **In what country do you practice?**

- 2 **What is your age?**
 - 18-24
 - 25-34
 - 35-44
 - 45-54
 - 55-64
 - 65 or above
- 3 **Please indicate your gender:**
 - M
 - F
 - other
- 4 **For how long are you in practice as consultant/staff surgeon?**
 - 0, still in a training position
 - 1-5
 - 6-10
 - 11-20
 - 21-30
 - over 30

- 5 **Please indicate your background training (multiple answers):**
 - general surgery
 - thoracic surgery
 - cardiothoracic surgery
 - thoracovascular surgery
 - other, please specify

- 6 **In which type of institution do you practice?**
 - academic hospital
 - supraregional, non-academic hospital
 - regional, non-academic hospital

- 7 **How would you rate the current timing and duration of the ESTS webinars?**
 - Excellent
 - Very good
 - Good
 - Fair
 - Poor

- 8 **What would be the ideal yearly amount of ESTS webinars presented?**
 - 2
 - 4
 - 6
 - 8
 - 10
 - 12

- 9 **What would be the ideal week day to present ESTS webinars?**
 - Monday
 - Tuesday
 - Wednesday
 - Thursday
 - Friday
 - Saturday
 - Sunday

- 10 What would be the ideal time of the day to present ESTS webinars?**
 7 AM CET
 8 AM CET
 9 AM CET
 4 PM CET
 5 PM CET
 6 PM CET
 7 PM CET
 8 PM CET
 9 PM CET
- 11 What would be the ideal duration of an ESTS webinar?**
 30 minutes
 45 minutes
 60 minutes
 75 minutes
 90 minutes
- 12 How would you rate the current content quality of the ESTS webinars?**
 Excellent
 Very good
 Good
 Fair
 Poor
- 13 Are you satisfied with the variety in subjects programmed?**
 not satisfied at all 0 1 2 3 4 5 6 7 8 9 extremely satis
- 14 Is the information objective enough?**
 not objective at all 0 1 2 3 4 5 6 7 8 9 very objective
- 15 Is the information enough up to date?**
 completely 0 1 2 3 4 5 6 7 8 9 the most recent informati
 outdated get
- 16 How would you rate the current quality of the ESTS webinar experts?**
 Excellent
 Very good
 Good
 Fair
 Poor
- 17 How biased or objective are the ESTS webinar experts in your opinion?**
 completely biased 1 2 3 4 5 6 7 8 9 10 extremely objective
- 18 Is there enough geographical spread amongst the institutions of the experts**
 Yes, fine
 No, too many European experts
 No, too many experts from other countries
- 19 Are you satisfied with the moderator/host of the webinar?**
 Yes, fine
 Yes, but a rotation between several moderators/hosts would be more appropriate

No, a rotation between several moderators/hosts should be mandatory
 No, another single moderator/host would be more appropriate

- 20 How would you rate the current format of the ESTS webinars (30minutes expert talk with a few MCQs and 30 minutes discussion)**
 Excellent
 Very good
 Good
 Fair
 Poor
- 21 What would be the ideal time spread of these items?**
- | | | | | | | |
|---|---|----|----|----|----|----|
| expert talk | 5 | 10 | 15 | 20 | 25 | 30 |
| interactive multiple choice questions | 5 | 10 | 15 | 20 | 25 | 30 |
| discussion based on questions from the audience | 5 | 10 | 15 | 20 | 25 | 30 |
- 22 How did you get information about the ESTS webinars?**
 ESTS website
 social media
 email
 friend/colleague
 other
- 23 How do you like the registration method?**
 I completely dislike it
 1 2 3 4 5 6 7 8 9 10
 I extremely like it
- 24 How do you like the image and sound quality?**
 I completely dislike it
 1 2 3 4 5 6 7 8 9 10
 I extremely like it
- 25 Do you more like to watch live or to watch the replay?**
 I always watch live
 I watch live most of the times, but depending on my availability
 I watch the replay most of the times, but when available I watch live
 I never watch live, I always watch the replay
- 26 How many webinars did you watch live?**
 1 2 3 4 5 6 7 8 9 10 11 12 13 14
- 27 From how many webinars did you watch the replay?**
 1 2 3 4 5 6 7 8 9 10 11 12 13 14
- 28 How likely is it that you would recommend an ESTS webinar to a friend or colleague?**
 I would never do that
 1 2 3 4 5 6 7 8 9 10
 extremely likely
- 29 What is the impact of the ESTS webinars on your thoracic surgery knowledge**
 no impact at all
 0 1 2 3 4 5 6 7 8 9 10
 All I have been watching was new information to
- 30 What is the impact of the ESTS webinars on your daily practice?**
 no impact at all
 0 1 2 3 4 5 6 7 8 9 10
 I completely changed my practice

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Author contribution Lieven P. DEPYPERE; and Nuria NOVOA, Niccolò DADDI and Hasan Fevzi BATIREL took part in conceptualization. Niccolò DADDI curated the data. Lieven P. DEPYPERE and Niccolò DADDI conducted the formal analysis. Lieven P. DEPYPERE; and Nuria NOVOA, Niccolò DADDI and Hasan Fevzi BATIREL carried out investigation. Lieven P. DEPYPERE, Nuria NOVOA, Niccolò DADDI, Jalal ASSOUAD, Apostolos C. AGRAFIOTIS, Olivia LAUK, Herbert DECALUWÉ, Pierre Emmanuel FALCOZ, Isabelle OPITZ, Alessandro BRUNELLI and Hasan Fevzi BATIREL were responsible for methodology. Hasan Fevzi BATIREL participated in the project administration. Lieven P. DEPYPERE and Niccolò DADDI contributed to software. Nuria NOVOA and Hasan Fevzi BATIREL performed supervision. Lieven P. DEPYPERE; and Nuria NOVOA and Hasan Fevzi BATIREL conducted validation. Lieven P. DEPYPERE; and Nuria NOVOA, Niccolò DADDI and Hasan Fevzi BATIREL contributed to visualization. Lieven P. DEPYPERE; and Nuria NOVOA and Hasan Fevzi BATIREL wrote the original draft. Lieven P. DEPYPERE, Nuria NOVOA, Niccolò DADDI, Jalal ASSOUAD, Apostolos C. AGRAFIOTIS, Olivia LAUK, Herbert DECALUWÉ, Pierre Emmanuel FALCOZ, Isabelle OPITZ, Alessandro BRUNELLI and Hasan Fevzi BATIREL wrote, reviewed and edited the manuscript.

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Declarations

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