The COVID-19 Pandemic and its Impact on Plastic Surgery in Europe – An ESPRAS Survey

Die COVID-19-Pandemie und ihre Auswirkungen auf die Plastische Chirurgie in Europa – Eine ESPRAS Übersicht

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ZUSAMMENFASSUNG

Der vorliegende Beitrag bietet einen Überblick über die aktuellen und bevorstehenden Auswirkungen von COVID-19 auf die Plastische Chirurgie in Europa und enthält die Erfahrungen der Abteilungen für Plastische Chirurgie, die durch Interviews von Mitgliedern des Exekutivkomitees (ExCo) der European Society of Plastic, Reconstructive and Aesthetic Surgery (ESPRAS) bewertet wurde. Ziel ist es, aktuelle Informationen in unserem Bereich zusammenzufassen und einer breiteren Leserschaft zugänglich zu machen. Insbesondere bei der raschen Entwicklung des Wissens in der aktuellen Pandemie kann natürlich nur eine Momentaufnahme angeboten werden, und es kann kein Anspruch auf Vollständigkeit erhoben werden.

ABSTRACT

The present article provides an overview of the current and expected effects of plastic surgery in Europe. It presents the experience of departments for plastic and reconstructive surgery, as evaluated by interviews with members of the Executive Committee (ExCo) of the European Society of Plastic, Reconstructive and Aesthetic Surgery (ESPRAS). The objective of this overview is to summmarise current information in our area of work and to make this accessible to a broad group of readers. As our knowledge is rapidly increasing during the current pandemic, it is evident that we can only provide a snapshot and this will inevitably be incomplete.

Introduction

The COVID-19 pandemic struck the entire world since its emergence in Wuhan, China. The first cases are linked to patients consuming food at the Hunan seafood and animal market, suggesting that initial transmission occurred from animal to human. Symptoms of the COVID-19 pandemic range from asymptomatic carriage of the virus up to fatal Severe Acute Respiratory Distress Syndrome [1]. Due to its high infectious and contagious nature and no available vaccine, the COVID-19 spread around the globe in an unprecedented manner [2]. As a result doctors around the world had and still have to face the largest medical challenge of the 21st century. Outbreaks with escalations in individual cities such as in Wuhan (China), Bergamo (Italy) or New York (USA) serve only as examples, but are just representative for many more regions that had to care for unseen numbers of critically ill patients needing ventilation therapy and life threating sequelae within days. Though emergence of the virus can be tracked back to Asia, many European countries and also the U. S. A. have been struck massively by the pandemic [2,3] (▶ **Table 1**).

Developments to date also show that traceability of the infection chain through extensive testing followed by rapid isolation or quarantine is an essential key to contain the pandemic as long as there is no vaccine or medication. In addition, previous knowledge has shown that even wearing a conventional nose mouth mask does not offer self-protection but nevertheless seems to prevent the potential transmission of COVID-19 from asymptomatic people [4].

The current COVID-19 pandemic has a massive impact on the everyday life of all people and of course also affects our field of plastic surgery. As doctors, we have the responsibility to reduce the transmission of the SARS CoV-2 virus from person to person and thus to slow down the uncontrolled, exponential increase in new cases. The aim is to flatten the curve of exponential infections and not to overload the limited amount of hospital beds, intensive care beds, respirators and ECMO devices. At the same time, we have to use the disposable medical items that are mostly not sufficiently available sparingly and concentrate them on the hospitals in which they are most urgently needed [5–7].

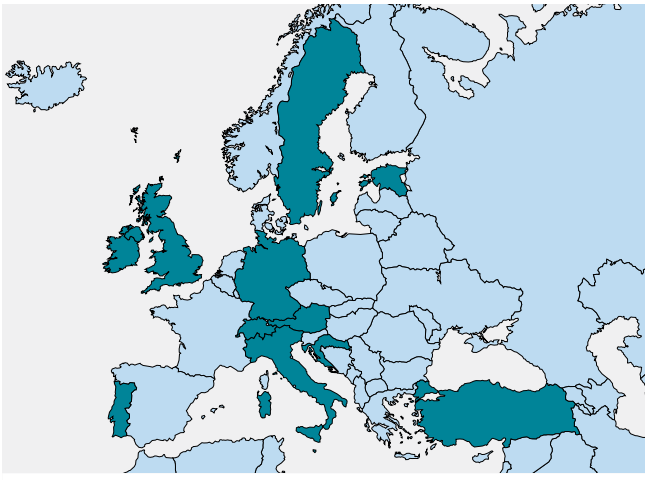
The present article provides an overview of the current and upcoming impact in plastic surgery in Europe and includes the experience of departments for plastic and reconstructive surgery, which were assessed by interviews amongst the Executive Committee (ExCo) members of the European Society for Plastic, Reconstructive and Aesthetic Surgery (ESPRAS). The aim is to give a survey on current information in our field and to make it accessible to a wider readership. Naturally, especially with the rapid development of knowledge in the current pandemic, only a snapshot can be given and no claim to completeness can be made.

Materials and methods

ExCo members of ESPRAS were interviewed after a first consensus online meeting on Sunday, 19th of April 2020 they have had to face regarding changes, regulations and obstacles they had to face as the COVID-19 pandemic spread over Europe. A total of 11 ExCo were contacted. Of those 11 answered (100 %). Members were asked to answer following questions:

- How many COVID-19 patients are currently treated in your hospital in ICU and COVID-19 ward?
- Do members of your staff work in COVID-19 care (COVID-19-ICU, outpatients etc.)?
- Are COVID-19 patients separated from other patients in your hospital/country?
- What is your testing routine? Do you test every patient?
- How long does a SARS-Cov-2-Test currently take you for obtaining the result?
- Do you have suffcient testing capacities in your hospital country?
- Do you have special COVID-19 operating theatres?
- What is your regimen for operations in COVID-19 patients in your hospital/country?
- Did you treat cases of a COVID-19 patient? How many?
- Please define Emergency Plastic Sugery in this pandemic in your hospital/country?
- Do you have criteria for urgent plastic surgery in your hospital/country?
- Do you have any restrictions on elective plastic surgery – please specify?
- Do you have any legal restrictions for elective plastic surgery?
- Do you have criteria for elective plastic surgery in your hospital/country?
- Do you include potential COVID-19 infection in your informed consent with patients?
- What is your regimen in this pandemic for tumor operations in your hospital/country?
- What is your regimen in this pandemic for handsurgery in your hospital/country?
- What is your regimen in this pandemic for reconstructive breast surgery in your hospital/country?
- What is your regimen in this pandemic for burn in your hospital/country?
- What is your regimen in this pandemic for aesthetic surgery in your hospital/country?
- How does the SARS-CoV-2-pandemic affect plastic surgeons in private practice in your country?
- Do you any restrictions with outpatients in your hospital/country?
- Do you use telemedicine now? Have you before this pandemic?
- What are the implications of this pandemic for students in your hospital/country (lectures, exams, elective terms etc.)?
- What are the implications of this pandemic for doctors in continuing education in plastic surgery in your hospital/country (operations/board examination etc.)?
- What are the implications of this pandemic for national/international scientific meetings in your hospital/country (cancellations, webinars etc.)?
- What are the exit strategies for Plastic Surgery in your hospital/country?

Responses were either collected via E-mail or telephone/video interview.



▶ **Fig. 1** ESPRAS ExCo COVID-19 Survey with 10 participating countries all over Europe (Portugal/Gaia, Ireland/Dublin, UK/Nottingham, Sweden/Gothenburg, Germany/Munich, Switzerland/Basel, Austria/Graz, Italy/Ancona, Croatia/Zagreb, Estonia/Tallinn and Turkey/Izmir).

Results

Replies from delegates from Ireland, Sweden, Turkey, Croatia, UK, Italy, Germany, Austria, Portugal, Switzerland and Estonia were evaluated (▶ **Fig. 1**). An average of 83.7 ± 89.9 patients with COVID-19 infections were currently treated in the assessed hospitals, while another 19.4 ± 12.9 patients were hospitalized in the respective ICUs. In seven of the eleven interviewed hospitals, members of your staff worked in Covid-19 care. In all interviewed hospitals (n = 11n, 100 %) normal patients were physically separated from Covid-19 positive patients. Testing routines differed among the interviewed countries. Croatia, UK, Germany, Portugal, Switzerland and Estonia tested all new patients for Covid-19 infection. Test results took in average 11.7 ± 12.2 hours, with Austria having the fastest results (1 h). All questioned institutions had sufficient testing capabilities (n = 11, 100 %). Nine out of eleven hospitals agreed upon specially designated Covid-19 surgery theatres, with Sweden and UK as an exception. All hospitals that were interviewed performed surgery on COVID-19 patients only if a deferral was not possible (n = 11, 100 %). A mean number of 2.1 ± 2.2 patients with a Covid-19 positive test was treated by the investigated hospitals (▶ **Table 2**). Eventhough restrictions varied within investigated countries, all hospitals only performed emergent and urgent surgeries as trauma surgery, oncological surgery that cannot be deferred and irrigation of infections (n = 11, 100 %). Legal implications, established guidelines and regimes, as well as effects on students and residences are summarized in ▶ **Table 3** and ▶ **Table 4**.

Discussion

This paper aimed to give an account of the current state for plastic surgeons over Europe. ESPRAS in its role as umbrella society to national societies for plastic surgery considers this necessary to potentially overcome common issues throughout Europe together and to give European plastic surgeons a panel for exchange in these crisis – ridden times. Naturally, this is an account of delegates of national societies for plastic surgery in individual hospitals being members of Executive Committee (ExCO) from the various regions of Europe and not an entire country. However, we consider the findings as representative for the respective situation in the interviewed countries. Interestingly, issues for plastic and reconstructive surgeons among the interviewed countries seemed to be very similar. Most of the interviewed plastic surgeons shut down their operation capacities except for emergencies, urgent surgeries, tumor surgery and burns. At the same time a high number of interviewed countries lend their staff to the intensive care unit, showing the commitment of plastic surgeons in this crisis all over Europe. While the "core" business of plastic and reconstructive surgeons was minimized to above mentioned cases it is notable that all participants showed a high participation in facing the crisis and supporting other departments, while at the same time in many instances changes in the infrastructure of patient treatment was achieved.

A high number of participants introduced telemedicine, which has in many instances not been used before or at least not as extensively as during the crisis. It should be noted that this can be considered as a "lesson learned" from the pandemic – consultation can and should be expanded using modern telecommunication through digitalization, as an appropriate "novel" tool in this crisis.

Especially for university hospitals education of students and also residents is mandatory. All institutions reacted in prompt manner and created online – solutions for students to continue education. This again proofed the necessity to better establish these tools in modern routines. However, even though webinars and online – exams are an intermediate solution it should be noted that a lot of knowledge transfer is occurring during bed – side teaching. Residents are in all countries not affected in terms of timely finishing their residency, however many participants noted that there might be delays in the training of residents as surgical cases were reduced during the pandemic and also prolongations for those who support COVID-19 patients on ICU´s and other places will have to be accepted.

It is of high importance to have a vivid exchange between the national societies of ESPRAS in the next steps during the pandemic: the exit and the return to elective surgery. While most responders are steadily increasing their surgeries by now, none are back to the working load they had to cope before the pandemic. Especially strategical solutions should be communicated among the societies to bundle strengths and forces in order to allow a smooth, fast exit from the pandemic caused regulations.

Insights into the respondents situation

Austria

In Austria we had our first cases on 25.02.2020. It is the first time that we have more patients per day recovered (330) than persons infected (208). So far the rigorous measures show an positive effect. Our healthy system is stable, at the moment we have enough intensive care beds for COVID-19 positive patients. Nevertheless, the measures and restrictions will be maintained by the government. Shops are closed except food stores until 14th April, schools are closed until 15th May and all events are forbidden until end of June. According to a regulation of the Austrian Chamber of Physi-

▶ **Table 1** Overview of COVID-19 actual cases, outcome and performed tests in Europe and globally Source https://www.worldometers.info/coronavirus/ April 22nd 2020).

Country	Total Cases	Total Deaths	Total Recovered	Active Cases	Serious Critical	Total Cases/ 1 Million Population	Deaths/ 1 Million Population	Total Tests	Tests/ 1 Million Population
Spain	204178	21282	82514	100382	7705	4367	455	930230	19896
Italy	183957	24648	51600	107709	2471	3043	408	1450150	23985
France	158050	20796	39181	98073	5433	2421	319	463662	7103
Germany	148453	5086	99400	43967	2908	1772	61	1728357	20629
UK	129044	17337	N/A	111363	1559	1901	255	535342	7886
Belgium	40956	5998	9002	25956	1079	3534	518	167110	14419
Netherlands	34134	3916	N/A	29968	1087	1992	229	171415	10004
Switzerland	28063	1478	19400	7185	386	3243	171	227554	26293
Portugal	21279	762	917	19700	213	2097	75	281907	27647
Ireland	16040	730	9233	6077	315	3248	148	111584	22598
Sweden	15322	1765	550	13007	515	1517	175	94500	9357
Austria	14873	491	10971	3411	196	1651	55	201794	22406
Europe	1146084	108008	350013	688063	26068				
USA	819175	45343	82973	690859	14016	2475	137	4190002	12659
China	82788	4632	77151	1005	78	58	3		
Global	2565495	177780	696781	1690934	57297	329	22,8		

cian it is not allowed to perform any elective surgery in private hospitals, institutions or offices. A new evaluation of the situation will be done by the government at the end of April. We think in general that in Austria we have responded to the COVID-19 pandemic at an early stage and that currently the positive development gives us courage and confidence. As of April 29th, 15402 Coronavirus cases have been reported, with 580 deaths and 12779 recoveries (▶ **Table 1**) [8].

Croatia

In Croatia we had our first cases on 26.02.2020, since then progressive measures have been implemented on basis of number of new cases each day. Travel between towns is by permission only, food stores and pharmacies are open with exception of stores with building materials in Zagreb due to damage from the earthquake on 23.03. 2020. We have 3 designated hospitals which treat Covid 19 positive patients, one in Split, and 2 in Zagreb. Additional facilities for less seriously ill patients are prepared in a sports arena in Zagreb. The local production facilities have started producing protective equipment which is in relatively short supply and some protective equipment has been secured from abroad (a donation from UAE and from China). Of 500 ventilators and 35 ecmo in Croatia, so far only 20 ventilators and 1 ECMO machine are being used. The public is satisfied with the government handling of the pandemic and the economic problems that it has caused. As of April 29th, 2062 Coronavirus cases have been reported, with 67 deaths and 1288 recoveries (▶ **Table 1**) [8].

Germany

In Germany the first patient with SARS-Cov-2 Virus infection was confirmed January 27th 2020 in Munich, Bavaria. Since March 13th schools, Kindergarten and universities are closed. Since March 22nd exit restrictions and a national curfew were imposed. All elective surgeries are currently forbidden in Germany which means that aesthetic surgery is currently not allowed by law. In hospitals, many plastic surgeons help in fighting COVID-19. The national society DGPRÄC is updating members daily on their website. As of April 29th, 160479 Coronavirus cases have been reported, with 6330 deaths and 120400 recoveries (▶ **Table 1**).

Ireland

In Ireland the first patient with SARS-Cov2 virus infection was diagnosed on the 29th of February. Ireland has faced a progressive lockdown of the country to the point where only essential workers (who need to carry identification) are allowed to go to work. Everyone else must stay at home but can go out within a 2 km radius of their home for shopping and exercise. All those over 70 or patients at risk or an underlying illness are being asked to cocoon. Ireland is at the moment starting to see a significant problem with lack of equipment for testing (mainly a reagent) and in some places PPE, however a major delivery from China of PPE was received last weekend. There are 22 clusters in nursing homes, and this is a serious concern. Ireland expected the 'Peak' around the 18th of April. The general sense is that the government and medical advisors are consistent and timely in the management of this pandemic. As of April 29th, 19877 Coronavirus cases have been reported, with 1159 deaths and 9233 recoveries (▶ **Table 1**).

Italy

In Italy the first patient with SARS-Cov-2 Virus infection was confirmed on the 30th of January 2020, when two tourists from China were positive for the virus in Rome. The first real focus of the COVID

▶ **Table 2** Answers for Questions 1–9

	Ireland	Sweden	Turkey	Republic of Croatia	UK	Italy	Germany	Austria	Portugal	Switzerland	Estonia
1. How many COVID-19 patients are currently treated in your hospital in ICU and COVID-19 ward?	18 (0)	139 (31)	61 (16)	29 (9)	320 (19)	99 (44)	58 (32)	6 (7)	71 (22)	6 (7)	114 (7)
2. Do members of your staff work in COVID-19 care (COVID-19-ICU, outpatients etc.)?	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
3. Are COVID-19 patients separated from other patients in your hospital/country?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. What is your testing routine? Do you test every patient?	Only if suspected	Only if suspected	Only if suspected + > 60 years + comorbidities	All patients	All patients	All patients + in-house patients if suspected	All patients	Only if suspected	All patients	All patients	All Patients
5. How long does a SARS-Cov-2-Test currently take you for obtaining the result?	48	10	24	4	4	7	6	1	12	12	6
6. Do you have suffcient testing capacities in your hospital country?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Do you have special COVID-19 operating theatres?	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
8. What is your regimen for operations in COVID-19 patients in your hospital/country?	Emergencies and urgent tumor surgery	Emergencies and urgent cases	Life and organ threatening emergencies in special operating rooms	Emergencies only	Emergencies and urgent cases	Emergencies, Trauma, Oncological surgery	Emergencies and urgent cases	Emergency cases	Emergency cases	Operation under isolation conditions, no wake-up room, special wards, FFP2 Masks and face shields, double glove	Operation theatre mode according Covid-19 protocol
9. Did you treat cases of a COVID-19 patient? How many?	No	No	No	2	4	2	0	6	0	3	0

▶ **Table 3** Answers for Questions 10–22

	Ireland	Sweden	Turkey	Republic of Croatia	UK	Italy	Germany	Austria	Portugal	Switzerland	Estonia
10. Please define Emergency Plastic Sugery in this pandemic in your hospital/country?	Trauma and cancer	Acute Trauma, Infections	Injuries requiring replantation/revascularization, any injury that can cause functional problems if not operated	Incision of abscess or excision of necrotic tissue, replantation in selected cases, escharotomy in burns	Infections, Trauma, Oncolody	Traum patients	Acute Trauma, Infections, oncological cases if deferral not possible	Acute hand-surgery, soft tissue trauma, burns, infections	Escarotomies, Fasciotomies in Burns and Trauma, Reimplantation, Orbital fractures with inferior rectus muscle entrapment, Active bleeding in Facial Trauma	Traumatic soft tissue defects, burn patients up to 20% BSA, severe soft tissue infections	Trauma patients (burns, soft tisuse mechanidal trauma, traumtic amputations, soft tisuse infection).
11. Do you have criteria for urgent plastic surgery in your hospital/country?	No	Surgery that cannot be deferred (melanoma scc, breast cancer)	Microsurgical revascularization emergencies, emergency hand injuries like tendon, artery and nerve damage, replantation, maxillofacial fractures and malignancies have metastasis risks (SCC and malignant melanoma)	Hand trauma: regional block; Urgent plastic surgery procedures are performed as before	Infections, Trauma, Oncolody	Individual basis	No, individual basis	Yes	Procedure are performed in a COVID-19 Operative Theatre	Yes	N/A
12. Do you have any restrictions on elective plastic surgery – please specify?	Yes	Yes (no surgery requiring ICU), prioritize children depending on age	No elective surgery	Only procedures that if not performed would result in worst prognosis (cancer/sarcoma/trauma)	Yes, only emergencies and tumor surgery	No elective surgeries	No elective surgeries	Yes	Yes	Yes	No elective surgery
13. Do you have any legal restrictions for elective plastic surgery?	No	No	Yes – All elective surgeries must be postponed	Yes – 14 day rotation of the staff (only 50% available), no aesthetic surgery	No	Yes – No elective surgeries	Yes – No elective surgeries	Yes	Yes	Yes	Yes

▶ **Table 3** continuation.

	Ireland	Sweden	Turkey	Republic of Croatia	UK	Italy	Germany	Austria	Portugal	Switzerland	Estonia
14. Do you have criteria for elective plastic surgery in your hospital/country?	No	Yes – only use resources for patients, which care should not be postponed)	Yes – No elective and aesthetic cases including minimally invasive procedures	Yes – No elective surgery	Yes – No elective surgery	Yes – No elective surgery	Yes – No elective surgery	Yes – No elective surgery	Yes – No elective surgery	Yes Any case that will not result in a permanent impairement or where the course oft he disease will have a worse outcome if not operated in the next 2 months	Yes – Elective plastic surgery has been suspended.
15. Do you include potential COVID-19 infection in your informed consent with patients?	Yes	N/A	Yes	No	Yes	Yes	Yes	No	Yes	N/A	Yes
16. What is your regimen in this pandemic for tumor operations in your hospital/country?	Anything that is likely to be a problem within six weeks	Follow protocol for each cancer, some chemo is delayed for some tumors in elderly	Any tumor with a risk of local or distant metastasis is allowed to be operated/surgical invention for tumors like BCC is postponed except for periocular localization	Only procedures that if not performed would result in worst prognosis	Urgency if adverse effect expected within 3 weeks	No second stage reconstruction	Urgency if adverse effect expected within foreseeable future	Tumor surgery performed as before	Deferral if possible	Oncologic surgery as before	Cases that cannot postponed are treated according to the Covid protocol
17. What is your regimen in this pandemic for handsurgery in your hospital/country?	Trauma only	N/A	Injuries requiring replantation/revascularization and any injury that can cause functional problems, if it is not operated	Emergency and urgent procedures	No elective surgeries, WALANT for emergencies	80% starting next week	Only trauma	Acute Trauma	Emergency	Emergency cases and acute trauma are operated if possible in WALANT, otherwise with anaesthesia, Replantations are performed	Only cases which are emergencies (open traumas burns infection)

▶ **Table 3** continuation.

	Ireland	Sweden	Turkey	Republic of Croatia	UK	Italy	Germany	Austria	Portugal	Switzerland	Estonia
18. What is your regimen in this pandemic for reconstructive breast surgery in your hospital/country?	No reconstruction	No immediate breast reconstruction, mircosurgical and implants based depending on the capacity	No immediate breast reconstruction nor prophylactic mastectomy	No complex reconstruction, primary reconstruction with implants and expanders is still performed	Not until 3 months	No second stage reconstruction	No second stage reconstruction	Only primary reconstruction	Oncoplastic surgery maintained, Only immediate reconstruction	Shift from primary autologous to temporary implant-based reconstruction in immediate reconstruction situation to save ICU- and OR-capacities	No breast surgery
19. What is your regimen in this pandemic for burn in your hospital/country?	Ermergency/ urgent only	According to their medical status	Treatment of burns applying Covid-19 precautions	No restriction s for burns	Emergencies only, conservative treatment preferred if possible	N/A	N/A	Burns are treated as usual, no elective scar revisions are performed	No changes	Burn patients are treated	No changes
20. What is your regimen in this pandemic for aesthetic surgery in your hospital/country?	No aesthetic surgery	No restriction	No aesthetic surgery, including minimally invasive procedures	No aesthetic surgery	National ban	Not at all	No aesthetic surgery	No aesthetic surgery	No aesthetic surgery	No aesthetic cases, forbidden by law	No aesthetic cases, forbidden by law
21. How does the SARS-CoV-2-pandemic affect plastic surgeons in private practice in your country?	public contract for three months offered	Reduction of number of patients asking for aesthetic procedures (economic reasons)	Many plastic surgeons in private practice stopped operating by the second half of March; negatively affected by this situation, salaries did get paid	Most plastic surgical private offices and Clinics have been closed/ government is supplementing the pay of staff that is on induced leave	All private practices on hold, private hospital groups have been contracted to the NHS	Completely stopped	Most of the private practices are closed	Most of the private practices are closed	No aesthetic surgeries allowed	Significantly, running costs for personnel and office without income	No aesthetic cases, forbidden by law
22. Do you any restrictions with outpatients in your hospital/country?	Most done by virtual clinics	Avoid seeing patients >70 yrs	Stopped appointment system by March 15th, all patients with no appointment were treated	Performed over the internet/patients that need to be seen are scheduled	Varies, mut locally reduced to minimal face – to – face contact	One third reduction	Reduced, use of telemedicine	Yes	No outpatients	Yes, outpatients are limited to 25% of usual practice, patients are timely seperated in waiting room	Deferred for now

▶ **Table 4** Answers for questions 23–27

	Ireland	Sweden	Turkey	Republic of Croatia	UK	Italy	Germany	Austria	Portugal	Switzerland	Estonia
23. Do you use telemedicine now? Have you before this pandemic?	Yes/No	Yes/Yes	Yes/Yes	Yes/Yes	Yes	Yes/Yes	Yes/No	Yes	Yes/No	No/No	Yes/Yes
24. What are the implications of this pandemic for students in your hospital/country (lectures, exams, elective terms etc.)?	Final medical students did the exam early, all other delayed	Exams will be performed according to schedule: multiple choice on clinical issues with time limit – performed from home, practical test with questions (more Q than usual), no oral exam	Break until end of March, exams postponed until summer period	Internet based programs	Senior students have been drafted, promoting webinars for educational purposes	Exams and lectures are online. No elective terms in the hospital	Exams and lectures are online, Senior students have been drafted	There are no students in the hospital, till now – no exams, lectures are virtual	Teaching stopped, webinars available	Virtual lectures, no practical Training with patients for the whole summer semester	Webinars, all exams postponed
25. What are the implications of this pandemic for doctors in continuing education in plastic surgery in your hospital/country (operations/board examination etc.)?	Fellowship/final exams postponed	None	Journal club via video conferencing systems, collaboration with other universities	transferred to the E learning platforms/postgraduate courses in plastic surgery are ongoing every day of the week for the past 3 weeks	At the moment an additional 6 months of training are anticipated	Cancelled	None so far	Acute operations are done also by trainees, no board examination, maybe the education time will be prolonged	All examinations are stopped	Reduced clinical and technical training in OR for 6 weeks, postponed theoretical training for 6 weeks, duty to compensate overtime hours and opportunity to publish papers. Postponement of exams will lead to delay in title aquisition and career building	Exams were postponed

▶**Table 4** continuation.

	Irland	Sweden	Turkey	Republic of Croatia	UK	Italy	Germany	Austria	Portugal	Switzerland	Estonia
26. What are the implications of this pandemic for national/ international scientific meetings in your hospital/ country (cancellations, webinars etc.)?	No travel/ all meetings cancelled	No meetings until August, exchanged for webinars	Alll national/ international meetings were postponed, webinars instead of some meetings, plastic surgery platform every Saturday (mostly COVID-19 issues)	All meetings have been cancelled; more continuous education through webinars than usual	Scientific meetings cancelles until summer		webinars	Initially all scientific meetings are cancelled till the end of August 2020, some webinars were performed	All meetings postponed	cancellations until end of August so far,	No meetings, social isolation until situation is clarified.
27. What are the exit strategies for Plastic Surgery in your hospital/ country?	no elective surgery is planned/ starting to discuss how to resume normality	Start up more and more when surgical capacity allows	define guidelines to restart the practice	return to seminormal work schedule, emergency area as a reserve, no emergency hand surgery for 3–6 months in covid positiv hospital	Currently in evolution, increasing work after peak	Operation room capacities will be reestablished by the end of this week, may 4th 80% of activity is targeted.	Operation room capacities are reestablished at the moment	Slow increase since this week	Increasing work since this week	Support the medical community where and if needed, restart after 6 weeks and work-up of waiting list, use time for CM and develop new concepts	Gradual opening of activities as pandemic situation becomes clear.

19 outbreak was in the region Lombardy, in which 16 patients were detected on the 16th of February, with the first consecutive death cases in the next days. The situation got progressively worse very fast, mostly in the regions Lombardy and in Veneto, though including almost all Northern Italy regions and part of Central Italy regions (Marche and Tuscany). On the 23th of February some towns in Northern Italy were isolated in quarantine, while on the 9th of March a total lockdown of Italy was decided by the government in order to reduce the possibility of contamination. This decision blocked somehow the widening of the disease in Southern Italy, where few cases are still reported. As of today, all schools, universities and public places are closed, excluding only essential businesses. Only essential workers are allowed to go to work, while everyone else must stay at home, but can leave their home within a perimeter of 200 meters. As of April 29th, 201505 Coronavirus cases have been reported, with 27359 deaths and 68941 recoveries. (▶ **Table 1**) All surgeries are currently forbidden in Italy, except for oncological surgeries and trauma surgery. At the moment, in the hospitals all doctors from all specialties help in fighting COVID-19. All kind of plastic surgery, foremost aesthetic surgery, has been stopped at the moment, while reconstructive surgery is allowed for first-stage post-traumatic or post-oncological purposes.

Portugal

In Portugal, the first patient was diagnosed with COVID-19 on the 2nd of March 2020. Since then there were progressive restrictions to people social activities by the Portuguese community. Strong national pressures was exerted on the Portuguese government to close social gathering spaces, schools and shops. Only after massive public pressure, the Portuguese authorities reacted and schools were closed on the 16th of March. On the 19th of March a State of Emergency was declared resulting in a lockdown of the country for 15 days. On the 2nd April a State of Emergency was declared resulting in a closure of almost all public spaced and shops. As of April 29th, 24505 Coronavirus cases have been reported, with 973 deaths and 1470 recoveries. (▶ **Table 1**) Portugal is facing the following problems at the moment: 1) delayed test results 2) shortage of PPE 3) too little ICU capacities, however numbers of ICU beds are increased across the country at the moment 4) evacuation of nursing homes for the elderly as COVID-19 infections spreaded 5) Delaying elective surgeries throughout all sectors. As of now, facing the problem seems to be addressed, however a deep concern about the consecutive economical situation is preceding.

Sweden

The COVID-19 situation seems to be under control at the moment. One issue for Sweden has been that both France and Germany shut their borders and did not transfer materials that were supposed to be exported to Sweden. However, local industries are starting up production to reduce the depencende on imports. At the westcoast (Gothenburg and surroundings, around 2 million people), the population has managed to stay ahead of COVID-19 patients. Designated COVID-19 space at the hospitals, both ICU, quarantine, and COVID-19 wards have been allocated. At the moment less COVID-19 patients are in treatment than expected. Testing capacity is increasing, but Sweden does not have the capacity to test everybody as of now. Only patients and staff are tested at the moment. Regarding serology on antibodies Sweden is waiting for reagents. This has been and is a problem because right now Sweden has to import these reagents. Stockholm was hit worst at first, as preparations were not carried out in a timely manner. Now Stockholm has 20 % ICU-capacity available. The exit strategy for Sweden aims to get immunity for 90 % of the people, however protection of the elderly (> 70 years) is a priority. However, in the caretaking of elderly, in some instances, staff was not educated in time to use protection and protection material was not available. To conclude, the COVID-19 situation seems to be under control at the moment. Sweden is recruiting a lot of extra staff. The main problem seems to be the dependence on imports from foreign countries. As of April 29th, 20302 Coronavirus cases have been reported, with 2462 deaths and 1005 recoveries (▶ **Table 1**).

Turkey

All the schools, including universities, are closed by March 13th. All the meetings, social gatherings, indoor and outdoor public activities were restricted. Home quarantine for people over 65 years and less than 20 years was applied. All elective surgical procedures, including minimally invasive procedures such as botulinum toxin and filler applications, were postponed except emergency and tumor cases. As of April 29th, 114653 Coronavirus cases have been reported, with 2992 deaths and 38809 recoveries (▶ **Table 1**).

United Kingdom

The UK has followed Italy in respect of the development trend of the pandemic and on 22nd April the number of reported deaths was 16,272. Taken by the day deaths occurred, the numbers are in decline with the seven-day rolling average of total deaths in England having now fallen five successive days between 11 April and 16 April [9]. Incidence and admissions overall appear to have plateaued. However there is much variation in incidence across the UK with 'hotspots' in London, Birmingham and the North West region including Manchester and Liverpool. There are ongoing issues related to availability and appropriate use of Personal Protection Equipment which are aggravated by the challenges of achieving accurate diagnosis and public and professional anxiety. In respect of deaths of healthcare professionals by 22nd April 119 cases had been identified of whom 98 had patient facing roles. Overall the rate of deaths appears to be largely consistent with the number of healthcare workers in the population and the distributions by occupation and geography are largely as expected. However, individuals of black and minority ethnicity are over-represented and conversely those working in the high risk specialties of anaesthesia and intensive care appear to be under-represented [10].

Conclusions

For us as plastic surgeons, it is of essential that we, as responsible doctors, work to reduce the transmission of viruses and free up the resources to treat patients who are seriously ill with the disease [11]. At the same time, the treatment of emergencies and urgent cases in our specialist area must be ensured for the population. Faster testing routines will allow for faster decision making whether surgeries can be performed in a safe manner for both, patient and

treating personnel. In addition, through our communications, we must actively participate in the discussion on the design of criteria and regulations to ensure the care of patients with COVID-19, and in the development of exit strategies for surgery as a whole, and in particular our specialist area.

Conflict of interest

The authors declare that they have no conflict of interest.

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