



# Brief history in the time of SARS-CoV-2 pandemic in Italy.

## A close look on a Plastic Surgery Unit and Plastic Surgeons efforts during the COVID-19 outbreak



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### Brief history in the time of SARS-CoV-2 pandemic in Italy. A close look on a Plastic Surgery Unit and Plastic Surgeons efforts during the COVID-19 outbreak

**BACKGROUND:** SARS-CoV-2 and its related COVID-19 are now affecting people worldwide. The pandemic, started at the end of 2019 and spread in Europe and all over the world at the beginning of the 2020, is the biggest threat to the health and to the economy of all countries, since the time of Spanish Flu. A global effort is being made to counter the virus with social distancing and restrictions, but our habits and behavior have dramatically been modified. Hospital activity has changed, and Plastic Surgery is affected as well as other disciplines.

**MATERIALS, METHODS AND RESULTS:** Our work describes the impact of the pandemic on a Plastic Surgery Unit in a tertiary care hospital and estimates the possible consequences in the near future. Elective procedures and consultations have been postponed and rescheduled, but we ensured treatment for life-threatening conditions and offered the best therapy, complying with the new safety standard to protect the patients and the healthcare providers. Media helped in keeping in touch the people, ensuring continuity in education and circulation of the data about SARS-CoV-2 research.

**CONCLUSION:** We don't know yet what the overall cost of the crisis will be on the global economy and on the National Health Systems. Definitely, it will be a big challenge to face, both for the Governments, for the people, as for healthcare providers. However, to date, we should remind our responsibilities as doctors, as we can contribute with our efforts and our knowledge to ensure continuity of care and research.

**KEY WORDS:** COVID, COVID-19, Italy, Outbreak, Pandemic, Plastic Surgery, SARS-Cov-2

### Introduction

SARS-CoV-2 pandemic is now affecting worldwide all the aspects of life, from the private relations to the work and research. As directly involved in the emergency, medicine and healthcare workers are more the other people facing the threat. Plastic surgery does not make exception.

The aim of this work is to evaluate the impact of SARS-CoV-2 on a Plastic Surgery Unit, its reaction and the modification of its activities related to the emergency state and to estimate the rebound effect at the end of the crisis.

### The first outbreak

Between November and early December 2019, a novel Coronavirus (2019-nCov) with a genetic sequence closely similar to bat betacoronavirus (up to 96% homology)<sup>1</sup> jumped as a single introduction into humans. Outbreak suspected source was identified in a live animal market named Huanan Seafood Market in Jianghan District in Wuhan (Hubei Province, China)<sup>1,2</sup>.

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Epidemic was reported to WHO on the 31st of December 2019 and, subsequently, exact viral causative agent was identified on 7<sup>th</sup> January 2020.<sup>2</sup> Despite a series of public health measures including quarantine of contacts in Wuhan, aggressive contact tracing, travel restrictions and advisories, epidemic extended to the whole province of Hubei and to other cities in China<sup>3</sup>.

On the 30th January 2020 the WHO Emergency Committee stated that the outbreak met the criteria for a Public Health Emergency of International Concern<sup>4</sup>. Since the 11th February 2020, 2019-nCov and its related disease were renamed respectively as SARS-CoV-2 and Coronavirus disease (COVID-19)<sup>5</sup> to worldwide identify the new threat.

Wuhan acted as a source for SARS-CoV-2 spreading worldwide, due to increased human mobility that characterizes XXI century, thus explaining first European imported cases. On March 11th, 2020, the World Health Organization (WHO) declared the pandemic state for COVID-19<sup>6</sup>.

## SARS-CoV-2 and COVID-19

It is assumed that SARS-CoV-2 has a great community transmission power, as on average each patient may infect up to 2 or 3 people<sup>7</sup>. To date, Italian infection fatality rate (IFR) and case fatality ratio (CFR) are estimated to be respectively 1.14% and 9.9. Chinese reports assess IFR about 0.66% and CFR about 4.0<sup>8,9</sup>.

Viral transmission is attributed to respiratory droplets that can spread between people who are within about 1.8 meters each other, travelling from an infected subject to a non-infected one through cough, sneezes or through fomites. Indeed, it seems that SARS-CoV-2 may survive for days on different surfaces and transmitted by people keeping the virus to their own upper airways or mucous membranes<sup>10</sup>.

Commonly COVID-19 is a syndrome characterized by a variety of symptoms appearing on 2nd to 14th days after exposure, such as fever, dry cough, sore throat, fatigue, body aches, shortness of breath, up to severe dyspnea, headache, abdominal pain, and diarrhea as well. Some people also may not present symptoms at all.<sup>11,12</sup>, but a percentage of symptomatic patients develops a severe acute respiratory syndrome (SARS) which needs intensive cares and mechanical ventilation support and can lead the patient to death<sup>13</sup>.

## Impact of COVID-19 in Italy

By the second half of January 2020, due to COVID-19 outbreak in East Asia, Italian Ministry of Health introduced a series of measures, to monitor the epidemic, starting from travelers coming from the outbreak zone<sup>14</sup>. Afterwards, due to WHO announcement of the COVID-

19 as a Public Health Emergency of International Concern, the Italian Council of Ministers declared the state of emergency all over the country on the 31st January 2020<sup>15</sup> and provided extraordinary measures to restrict viral spread. Among these, quarantines for Italian citizens coming back from East Asia, tight controls at international airports and interruption of air traffic from China were applied.

First confirmed cases were a couple of Chinese tourists from Wuhan, in Italy from the 23rd January 2020, after they were hospitalized at Spallanzani Hospital in Rome<sup>16</sup>.

No new cases were discovered until the epidemic affected Italian citizens of two small towns of the Northern Italy. Codogno in Lombardy was considered the main outbreak of the epidemic. The virus was discovered on the 20th of January but no patient zero was founded. Thence, the infection spread in the whole region<sup>17-19</sup>. Vo' Euganeo in Veneto was the secondary outbreak of SARS-CoV-2 after two patients were found positive due to swabs examination on the 21st February 2020<sup>20</sup>. These cases probably lead to an infection chain, due to person-to-person transmission, to date, generating the largest COVID-19 outbreak outside Asia.

Phylogenetic viral sequences analysis provided that the SARS-CoV-2 was introduced in Italy probably on the 25th January by a German patient infected by a Shanghai manager that had contact with the patient "one" in Codogno, thus with no link with the two Chinese tourist in Rome<sup>21,22</sup>. Indeed, analysis of viral strains from the two Chinese tourists revealed that the isolated SARS-CoV-2 was similar to the Chinese strains of the epidemic dating back to January 2019<sup>16</sup>.

As a consequence of the spread of SARS-CoV2 in Italy, on the 23rd February 2020 the Prime Minister of Italy established a quarantine red zone, trying to contain the epidemic, extended to 11 towns in Lombardy and Veneto<sup>23</sup>. Subsequent virus circulation infection led to the further measures like social distancing measures, applied on the total Italian jurisdiction<sup>24</sup>. The 9th March 2020 Italy was considered "red zone" where schools, universities and non-essential services interruption has been imposed by the Government<sup>25</sup>. The lockdown period lasted until the 4<sup>th</sup> May<sup>26</sup>. Since then, non-essential services began to be gradually restored.

To the 4<sup>th</sup> of May, WHO estimated 210717 confirmed cases and 28884 deaths in Italy<sup>27</sup>.

## Methods

IMPACT OF COVID-19 ON VENETO AND PADUA  
UNIVERSITY HOSPITAL

The Governor of Veneto established a hospital network to manage COVID-19 emergency, selecting one single center dedicated to Covid-19 for each of the seven

provinces. In adaptation to the measures issued by the government, since 11th March 2020 Padua University Hospital adopted a new policy in managing COVID-19 emergency, suspending non-urgent surgical activity, non-urgent consultations and outpatient/inpatient private practice<sup>28</sup>.

Furthermore, the Italian National Society of Plastic Surgery (SICPRE) recommended to stop scheduling non-urgent and aesthetic surgical procedures<sup>29</sup>.

Padua University Hospital has a catchment area of roughly 936.000 inhabitants, and it is considered a tertiary care hospital. It quickly reacted to the SARS-CoV-2 outbreak, putting in place a series of measures that gradually changed routine hospital activities, but ensuring essential public health services that could not be delayed because of COVID-19 emergency. These measures, according to Government decisions, impacted on Plastic Surgery Clinic daily organization.

The Plastic Surgery Unit, belonging to Neuroscience Department, is composed by an outpatient service, adult and pediatric wards (25 beds total), and four operating theatres. Surgical activity is provided by 6 consultants, 2 researchers and 19 resident doctors. Every year more than 3100 admissions and 3250 procedures are performed, including elective and urgent/emergent surgeries. Furthermore, over 7000 outpatient procedures and over 10000 outpatient consultations are performed.

Daily activities have been modified in order to prepare for a possible surge of COVID-19-related admissions, and to reduce the risk of spread of SARS-CoV-2 infection among workers and patients during admission and outpatient consultations. Also, the relocation of healthcare professionals among newly created COVID-19 Units has been taken into consideration in order to not over-stress intensive care units and anesthesiologists. Patients temperature has been regularly checked up at admission, extensive use of PPE (Personal Protective Equipment) devices inside the hospital has been strongly recommended and all personnel has been tested with screening upper airways swabs. The presence of dedicated caretaker for inpatients has been forbidden, unless strictly required by the law (e.g. minors and disabled patients). All patients have been screened by telephonic survey before they arrived at the hospital to verify the possibility of symptoms related to COVID-19.

Routine ward activities have been modified as well. Daily morning meetings have been reduced to essential personnel, with physical distancing maintained, as per Government guidelines, to 1 meter from each other.

All not urgent procedures have been rescheduled to a minimum of 6 months later, but oncologic and trauma surgery (categorized as class A conditions, needing treatment within a month) have been prioritized and are consistently performed complying with the decision of the Governor of Veneto. Elective surgery such as post bariatric surgery, reconstructive breast surgery, elective hand surgery and other minor procedures have been sys-

tematically delayed, thus reducing ordinary hospitalizations (more than one-day admittance) and day hospital admittances.

Plastic Surgery outpatient consultation activity has changed considerably as well: Class D and P bookings (respectively Deferrable, within 30 days or Programmable, within 90 days) for consultation have been deleted and rescheduled, in favor of class U and B (respectively Urgent, within 48 hours, and Short, within 10 days) that are provided by the Clinic. The latter include, likewise the class A condition for surgery, traumas, burns, tumors and all life-threatening issues. Some patients have been consulted via telephone, as well, and medical staff has been available for any clarification or doubt. The number of patients in waiting rooms has been reduced to avoid the risk of contagion and the presence of a relative during consultation has been forbidden, except for minors and disabled patients.

Monthly research meetings, journal clubs, multidisciplinary meetings and national meetings, as well, have been deleted or postponed, but teachings activities to Medicine and Surgery and Nurses School have been ensured by telematic services via video conferencing, providing continuity of education for aspiring doctors and nurses.

A part of the surgical team has been reassigned to create a task force of "Plastic Surgeons against COVID-19", in order to evaluate the impact of pandemic, to face its direct consequences after the emergency and to make our knowledge, as plastic surgeons, available in the research on SARS-CoV-2, cooperating with other physician directly involved in the crisis.

Finally, the Managers of Padua University Hospital and the Head of Schools of Residency, as the forefront of the efforts in Veneto, required secondment of a fraction of healthcare workers and volunteer residents to manage newborn COVID-19 units.

These measures lasted until the end of lockdown, then elective surgical activity and non-urgent consultations began to be gradually restored.

## Results

Employment of operating theatres has been reduced from four (Monday to Friday: major theatre 8 am – 6 pm, minor theatre 8 am – 2pm, day surgery theatre 8 am – 2 pm; urgency theatre 24/7) to only two theaters daily (major theatre 8 am – 6pm and urgency theatre 24/7). Total hours of scheduled inpatient surgery (excluding unexpected procedures as urgencies) has been reduced to 10 hours/day compared to the previous regimen of 22 hours/day.

The number of elective procedures performed between 12th March and 3rd May 2020 has been 221, including day hospital and ordinary hospitalization. Compared to the same period in 2019 (540 procedures), we have observed a reduction of 59.1%. Non-melanoma skin can-

TABLE I - Elective procedures performed in the same period (12th March-3rd May) in 2019 and 2020: sum of procedures and divided into categories.

	12th March 3rd May 2019		12th March 3rd May 2020	
	No.	%	No.	%
Oncologic Surgery	229	42.4%	129	58.4%
Hand Surgery	59	10.9%	7	3.2%
Post-Bariatric Surgery	83	15.4%	0	0%
Burns Surgery	53	9.8%	39	17.6%
Other Surgeries	64	11.8%	32	14.5%
Breast Surgery	32	5.9%	0	0%
Oncoplastic Surgery	20	3.8%	14	6.4%
Total	540	100%	221	100%

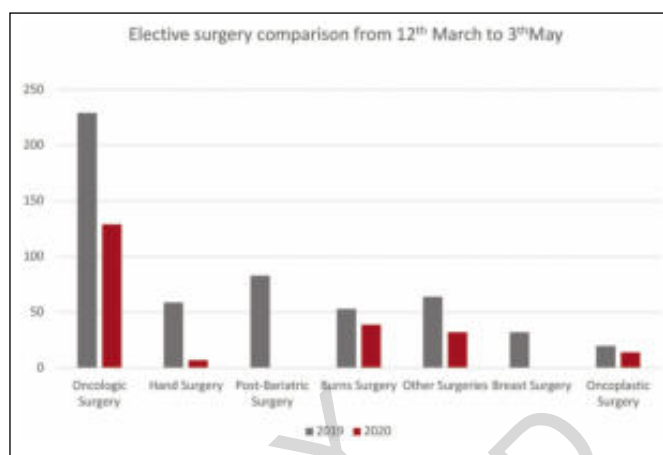


Fig. 1

TABLE II - Subtypes of the elective procedures included in the categories presented in Table I

Categories	Subtypes of surgery
Oncologic Surgery	Skin, soft tissue and breast tumors resection
Hand Surgery	Correction of carpal tunnel, Dupuytren disease, trigger finger, Arthrolysis
Post-Bariatric surgery	Abdominoplasty, brachioplasty, mastopexy, thigh lift, lower body lift
Burns Surgery	Escharotomies, escharectomies, autologous and human amniotic membrane grafting
Breast Surgery	Reductive mammoplasty, NAC reconstruction, lipofilling, release of capsular contracture and/or prosthesis substitution
Other Surgeries	Treatment of necrotizing fasciitis, infected ulcers or wounds, various reconstructions
Oncoplastic Surgery	Microsurgical free flap, tissue expander reconstruction

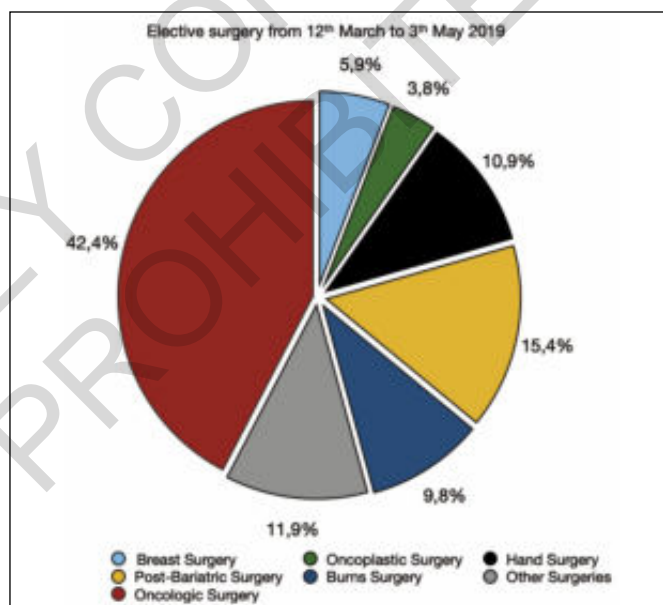


Fig. 2

cers (NMSC), melanoma and sarcomas have still remained the large part of all procedures performed, increasing proportionally compared to the other pathologies, despite a reduction in number compared to last year (229 procedures, 42.4%, in 2019 vs 129 procedures, 58.4% in 2020) (Tables I, II; Figs. 1, 2, 3).

A special attention has been addressed to microsurgery. Usually our Plastic Surgery Unit performs one microsurgical procedure per week. During the analyzed period, primary oncologic and post traumatic cases have been considered for microsurgical reconstruction, despite the long requested operating time, while secondary breast reconstruction cases and other deferrable procedures have been postponed, thus trying to maintain the spaces dedicated to microsurgery (9 procedures in 2019 vs. 3 procedures in 2020).

Outpatient surgery services, despite maintaining the usual 6 hours/day activity from Monday to Friday, reduced

the number of procedures to 286 between 12<sup>th</sup> March and 3<sup>rd</sup> May, compared with the 382 in the same period in 2019 (25.1% reduction).

Some of the procedures scheduled during the outbreak have been postponed or deleted, due to patients' concern about contagion risk. Some of them have asked to reschedule or delete their surgeries.

We have noticed a gap about urgent procedures in the period from 12<sup>th</sup> March to 3<sup>rd</sup> May 2020 (161 urgent surgeries), compared to the same interval in 2019 (204 urgent surgeries), estimating a reduction of 21.1% (Table III; Fig. 4). It seems that some kind of traumas have increased. Indeed, because of the restrictions and advisories imposed by the Government we have noticed a modification on urgencies trend, related to home accidents, especially hand traumas and burns. Due to the quarantine imposed to the inhabitants and the closure of unnecessary activities, a reduction of workplace acci-

TABLE III - Urgent procedures performed in the same period (12th March-3rd May) in 2019 and 2020: sum of procedures and divided into categories.

	12th March 3rd May 2019			12th March 3rd May 2020		
	n. (%)	Home (%)	Work (%)	n. (%)	Home (%)	Work (%)
Hand Traumas	107(52.5%)	74(69.2%)	33(30.8%)	96(59.6%)	74 (54%)	22 (46%)
General Traumas	62(30.4%)	57(91.9%)	5(8.1%)	39 (24.2%)	38 (97.4%)	1 (2.6%)
Burns	35(17.1%)	31(88.6%)	4(11.4%)	26 (16.2%)	25(96.1%)	1 (3.9%)
Total	204 (100%)	162(79.4%)	42 (20.6%)	161(100%)	137(85.1%)	24(24.9%)

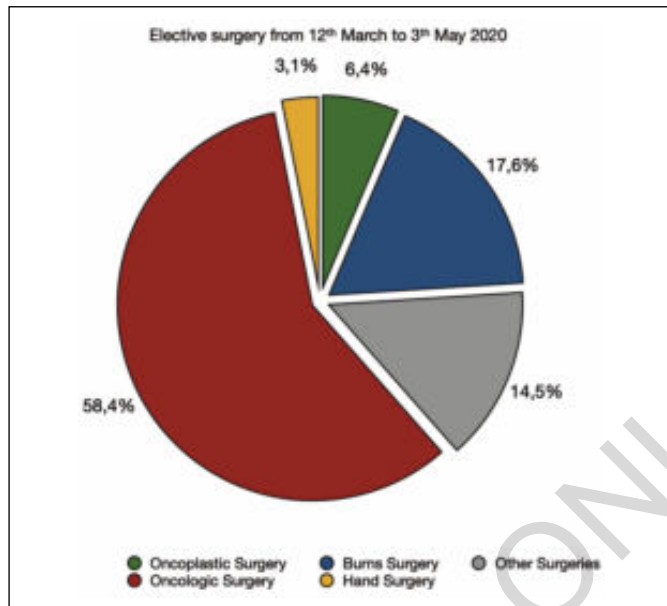


Fig. 3

dents has occurred (20.6% in 2020 vs. 24.9% in 2019), to the detriment of an increase of home traumas (85.1% in 2020 vs. 79.4% in 2019), probably due to the forced and prolonged staying at home: bricolage, yard working and hobbies could have been resulted in accidental wounds. Thus, urgent hand traumas and burns have raised up.

Outpatient consultation services (8 am – 6 pm) have been reduced as well. Between the 12th March and the 3rd May 2020, about 1074 consultations have been provided, in contrast with the 2804 performed on the same period in 2019, with a reduction of 61.7%.

Finally, we have noticed a reduction of 82.1%as regards non-proper urgent consultations for plastic surgery (56 in 2019 vs. 10 in 2020).

## Discussion

Measures against COVID-19 pandemic put in place by the Hospital, adhering to Government and Region advisories, contributed to reduce the risk of contagion. From the early days of spread of the infection, we aimed in improving protection both of the patients and of the

healthcare providers. To date, the taken precautions allowed the personnel to carry out safely its work without contracting the infection (all Plastic Surgery Unit personnel tested negative for SARS-CoV-2 screening swabs).

International webinars, online courses, and free access to a large amount of literature related to the pandemic have been of great support in the educational effort. The important role that the media are playing during this crisis, in providing continuity of education in medicine and in making up for human relationships, severely affected by the restrictions, suggests that they will be considered as a useful tool even more in the near future. Unfortunately, most of clinical researches have been affected by the pandemic as well. Many patients have not been allowed to access the hospital for trials. Laboratories not directly related to SARS-CoV-2 research have reduced the activity and clinical chart offices have been closed due to the quarantine measures.

The rescheduling of all surgical activities resulted in the interruption of providing deferrable procedures such as post-bariatric surgery, breast reconstructive surgery, treatment of chronic wounds and hand elective surgery, postponing them after the crisis resolution. Nevertheless, life-threatening conditions, such as burns, traumas and tumors, have been promptly addressed with the usual standard of treatment, despite the difficulties associated to the lack of resources, as they have been mostly addressed to counter COVID-19 outbreak. The decision to maintain the microsurgery option for patients during an emergency such as the pandemic, is consistent with the principle of offering the gold standard reconstructive chance to all patients, according to “the reconstructive elevator concept”<sup>30</sup>. Despite we have had to reduce the activity, the good surgical practice has been warranted and even the most complex procedures have been successfully accomplished.

A special mention goes to the observed reduction of non-proper urgent consultations. Actually, it should aware emergency service doctors and consultant plastic surgeons how the access to the emergency service is poorly managed and people misuse the ER to bypass the waiting for deferrable conditions.

These provisions followed by most of the departments in Italian Hospitals, as resulted from literature for Dermatological Clinic of United Hospital of Ancona



City<sup>31</sup>, adhere to what has been done by other foreign hospitals as reported by several authors. Examples of rearrangement of a non-directly involved in COVID-19 patients' management department is discussed by Chan et al., in Singapore<sup>32</sup>.

Certainly, the pandemic has changed our habits and will affect global behavior. Plastic surgery and its priorities have evolved as well, due to the high number of elective surgeries it deals with. Rescheduling elective surgery will slow the pathway therapy of some patients, despite the supporting social distancing in the healthcare settings. Therefore, we have to face COVID-19 consequences in this period marked by uncertainty and such a thought is now shared globally among plastic surgeons<sup>33</sup>.

## Conclusion

The reduction of services, thus the postponement of the deferrable procedures will certainly lead to an increase in the waiting lists, once the global crisis has been resolved. Therefore, the Italian National Health System and local realities will have to make an even greater effort to restore a normal situation. People will have to be educated in the proper use of health system resources to not overstress its capacity and capability. More attention will have to be paid to the medical research and education of healthcare workers. Finally, it will be necessary to reconsider the organization of hospital activities and the investments in healthcare, considering that a similar crisis could repeat itself and we must not be found unprepared once again. Even if pandemics are far removed from Plastic Surgery, we should remember our responsibilities as doctors first and foremost, as we can contribute with our efforts and our knowledge to in ensuring continuity of care and research.

## Riassunto

Oggi il virus SARS-CoV-2 rappresenta una minaccia per la popolazione mondiale. La pandemia, iniziata alla fine del 2019 e diffusasi in Europa e in tutto il mondo all'inizio del 2020 è la più grande minaccia alla salute e all'economia di tutti i paesi dai tempi dell'Influenza Spagnola. Uno sforzo globale è in atto per contenere il virus con il distanziamento sociale e le restrizioni. Le nostre abitudini e i nostri comportamenti sono cambiati drasticamente. Anche l'attività ospedaliera è cambiata e la Chirurgia Plastica è stata colpita come le altre discipline. Il nostro lavoro descrive l'impatto della pandemia su una Unità di Chirurgia Plastica in un centro ospedaliero di terzo livello e stima le possibili ripercussioni nel futuro prossimo. Le procedure chirurgiche e le visite elettive sono state posposte e riprogrammate, ma sono stati assicurati i trattamenti per le patologie urgenti ed è stata offerta la migliore terapia disponibile nonostante l'emergenza, nel

rispetto dei nuovi standard di sicurezza, per proteggere il paziente e i professionisti della salute. I media hanno tenuto in contatto le persone, assicurando la continuità nell'educazione e la circolazione dei dati scientifici riguardo la ricerca sul SARS-CoV-2.

Non sappiamo ancora quale sarà il costo complessivo della crisi sull'economia globale e sui Sistemi Sanitari Nazionali. Sicuramente rappresenterà una grande sfida da affrontare per i Governi, per i pazienti e per gli operatori sanitari. Dobbiamo dunque ricordare le nostre responsabilità come medici per assicurare con i nostri sforzi e la nostra conoscenza la continuità delle cure e della ricerca.

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