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Managing covid-19 pandemic: an italian experience in surgery department

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Introduction

- December 31, 2019: the first case of pneumonia of unknown cause was detected in Wuhan and reported to The Who Country Office in China.

- January 30, 2020:7818 confirmed cases globally, 82 in 18 countries outside of China. [1]
    - A couple of Chinese tourists coming from Wuhan were the first two cases of confirmed SARS-Cov-2 (the novel coronavirus causing atypical pneumonia) acute respiratory disease identified in Italy. [2]
    - World Health Organizations (WHO) declared the outbreak to be a public health emergency of international concern. [1]
    - The Emergency Committee has provided advice to the global community on measures to control this outbreak, believing that it was still possible to interrupt the virus' spread: countries must put in place strong measures to detect disease early, isolate and treat cases, trace contacts, and promote social distancing measures commensurate with the risk.

- February 20, 2020: 75748 confirmed cases globally, 1073 in 26 countries outside of China. [1]
    - A 38-old male from Codogno (Lombardy) was hospitalized for atypical pneumonia caused by 2019-nCoV, and in the next few days four other people were referred to the Infections Disease Centre of Luigi Sacco Hospital.

- March 11, 2020:118319 confirmed cases globally, 37364 in 113 countries outside of China. [1]
    - WHO made the assessment that COVID-19 (the respiratory disease caused by 2019-nCov) can be characterized as a pandemic, concerning about the alarming levels of spread, severity and inaction. Dr. Tedros Adhanom Ghebreyesus, WHO director-general, said at a media briefing: "This is not just a public health crisis, it is a crisis that will touch every sector. So every sector and every individual must be involved in the fights." [3] **(Figure 1, 2)**.

Figure 1. Countries, territories or areas with reported confirm cases of COVID-19, 11 March 2020 (WHO website).

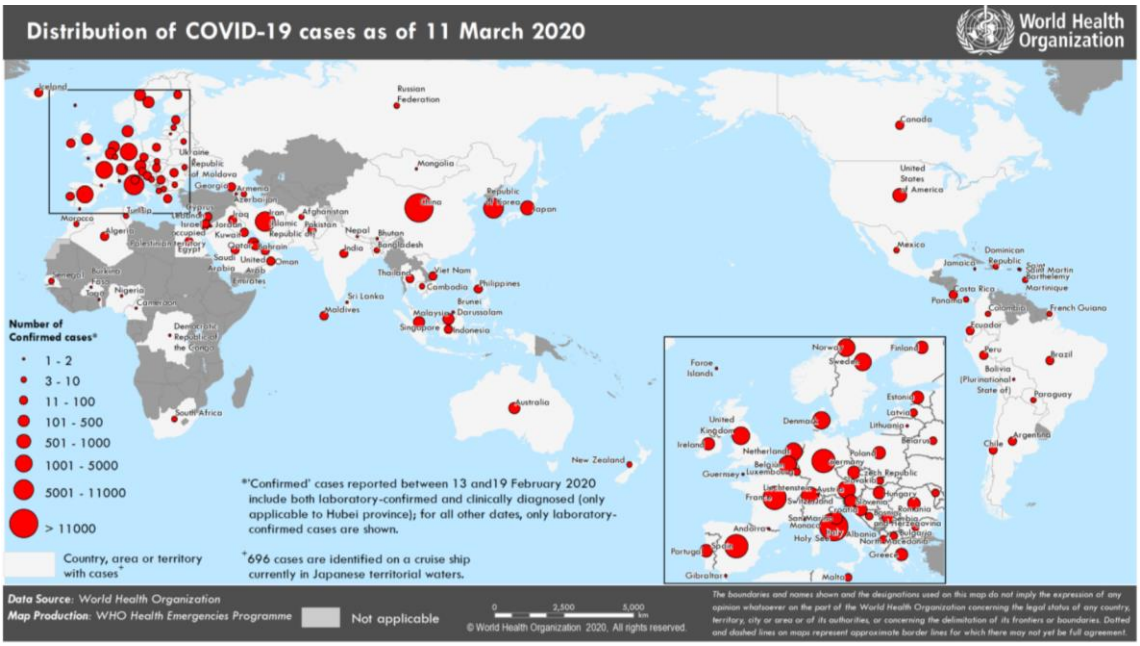
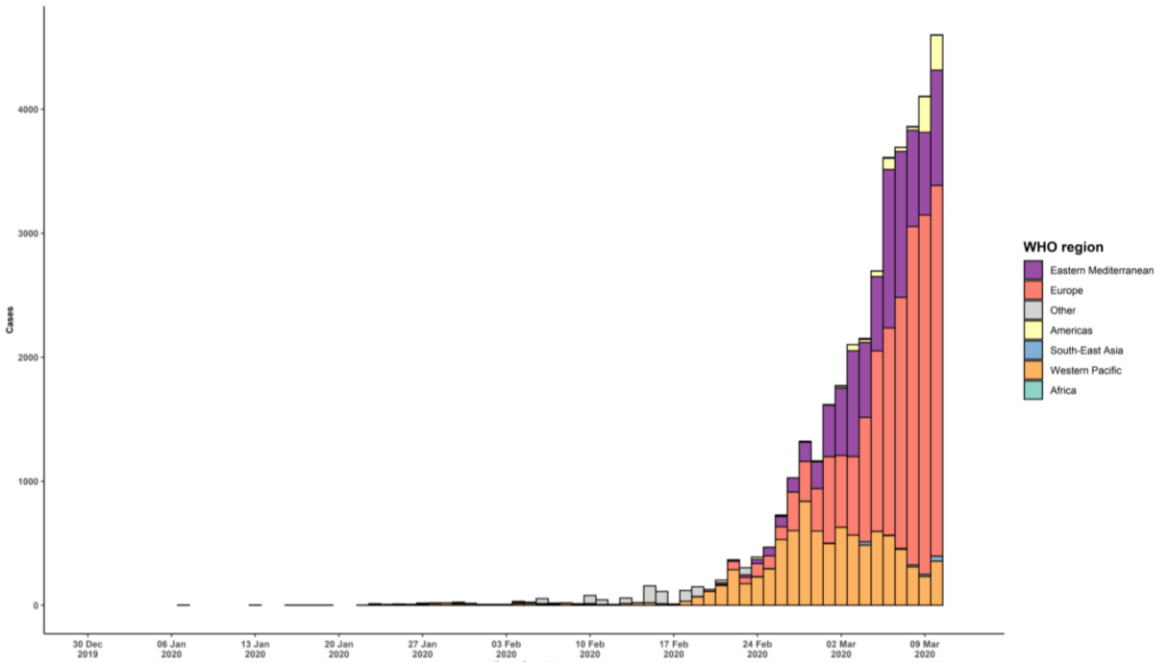


Figure 2. Epidemic curve of confirmed COVID-19 cases reported outside of China, by date of report and WHO region through 11 March 2020 (WHO website).



Two months ago, when the epidemic broke out in Wuhan, it would have been difficult to imagine that an epidemic could so rapidly spread in our continent, in our hospital and to predict the impact it would have globally. [4,5]

Everything has changed since February 21: 4 people were urgently addressed to the Infectious Disease Reference Centre Luigi Sacco Hospital in Milan. On February 23 the Italian Government put in place extraordinary measures in order to contain the infection, first to the region affected by the virus' spread, in the next days extended to all Italian regions and increasingly restrictive. [6] At the same time, an ever-increasing number or COVID-19 suspected or confirmed patients arrived to our emergency room needing hospitalization or intensive care, along with all those asymptomatic people afraid of being exposed to the virus.

All Ambulances coming from the territory with non-COVID patients were prevented to head to Sacco Hospital, at which only suspected cases from the territory or from other hospitals were allowed.

A reorganization of the hospital structure was immediately put in place: a new and larger Intensive Care Unit was established at the Infectious Disease Department; the emergency room was almost completely dedicated to infected patients; all hospitalized patients that could go home were discharged and those who cannot were transferred to other hospitals or to department considered "COVID-free"; elective surgery has been stopped; all patients admitted to the surgical department who did not require urgent treatment were discharged; all non-urgent outpatients visits were suspended, in order to minimize hospital access.

Obviously, together with this structural reorganization, medical and nursing staff has been reassigned to the department involved in the emergency: at first anaesthesiologists and nurses with experience in critical areas were recruited, but after a few days also surgeons were involved. Since March 10, about half of general surgeons together with urologists, orthopaedics, otolaryngologists and ophthalmologist were employed in the emergency department and dedicated to the management of highly suspected or confirmed patients with mild and moderate symptoms waiting for admission or quarantine discharge. These surgeons were all excluded from surgical activities, both in the surgical department and in the operating theatre. Courses on appropriate use of personal protective equipment (PPE) as well as on respiratory failure diagnostic and treatment were held.

Surgical service metamorphosis

As a consequences of these measures, surgical service has been transformed: the number of beds assigned to surgery has been halved, from 40 to 20 comprising all surgical specialities (general surgery, urology, orthopaedic, otolaryngology) due to the transfer of the medical and nursing staff; the week-surgery ward was closed and dedicated to suspected patients from the emergency room, waiting for laboratory tests and eventually admission; initially from February 22 to March 1, the operating room was almost paralysed: no elective surgery was performed and only few urgent surgical interventions were performed.

Despite the crisis and resources scarcity, in the following days a more rational reorganization of the surgical activity was carried out, following indications provided by Lombardy Region Authorities and relying on local, national and international recommendations and guidelines; the attentions must be focused on the fact that there should be no difference in allocation resources between COVID-patients and those with other conditions, including cancer or life-threatening conditions requiring prompt surgical attention, and allocation of resources should be applied maximizing benefits across patients who need them. [7,8,9,10,11,12]

- Elective surgeries as well as outpatients non-urgent medical visits continued to be postponed, reducing unnecessary patients traffic in the hospital and spread of disease between patients and health care staff, and saving resources in term of health staff, hospital beds and PPE. [7,8,9,10,11,12,13]

- A plan for cancer surgeries has been drawn up: obviously long-term outcomes are dependent on timely intervention in these patients and the emotional impact of cancer patients who see their intervention delayed should not be underestimated; for oncological patients who need general or abdominal surgery a panel of experts established by Lombardy Region Authorities defined the criteria to list them on an urgent basis:

    1. Patients which should undergo surgery within two weeks (high cancer aggressiveness or absence of non-surgical options).
    2. Patients which should undergo surgery within two months (intermediate cancer aggressiveness or high aggressive cancer that could undergo alternative bridging procedures and then to surgery).
    3. Surgery delayed beyond two months (low cancer aggressiveness or intermediate aggressive cancer that could undergo bridging procedures).

    Patients with these features without planned postoperative Intensive Care Unit admission could be operated in our hospital, not exceeding 25-30% of normal elective and urgent surgical activity. Moreover as indicated by Regional Authorities surgical hubs are identified where to refer oncological surgical patients that cannot be managed in the hospital.

- All non-surgical options should be considered both for COVID positive and negative patients, both in urgent and elective setting: this has the aim to postpone as much as possible or avoid surgical procedure, saving resources and decreasing health workers exposition. Moreover, existing literature reports a very high mortality rate in positive patients undergone surgery, due to the greater risk of respiratory complications linked to COVID-19. This higher risk must be clearly explained in the informed consent to the procedure.

- At the admission all elective patients should be separated from negative patients and investigated for suspected symptoms and exposition in the previous days; they should undergo naso- and oro-pharyngeal swab and thorax X-ray. In doubtful cases a thorax CT-scan or a pulmonary ultrasound is performed. In patients who need a CT-scan (for example for cancer staging), the chest CT-scan is straight performed.

- All acute surgical patients, even if asymptomatic, have to be considered as suspected for COVID-19 until laboratory and radiological results are available.

- Surgeons and nurses teams have been identified to manage with clean or infected patients, and they must be compartmentalised as much as possible. Health care workers have been specifically trained to identify which type of PPE are needed depending on the aerosol generating risk level and to don, doff, and dispose of PPE, including masks or filtering face piece, eye protection, double gloves, caps and gowns, thorough videos and practical session.

- Local operative guidelines have been issued to identify separated pathways for COVID positive or negative patients (wards, operating theatre, elevators, hallways). The operating spaces for patients COVID positive have been identified and should be emptied of non-essential materials, including personal items (such as cell phones and pens); operators (surgeons, anaesthetists, nurses, technicians) should enter the operating room in a timely manner to minimize exposure to infected patients and dedicated doffing areas should be identified. Medical students are not admitted to the hospital. Surgical trainees should not be involved with cases unnecessarily.

- The access to the ward for patients' visitors is not allowed for COVID positive patients and is strictly controlled for negative patients: only one visitor is admitted daily and has to be educated about PPE wearing; any exceptions should be discussed on a case-by-case basis with the Department Director. Communication with patients' family members should be facilitated with communications tools like smartphone and tablets.

Reallocation of surgical staff

Since March 9, as more COVID-19 patients arrived and crowded the emergency room, further medical staff reassignment was needed. An urgent department meeting was held and balanced team were created to cope with the emergency and at the same time to maintain effective the surgical service. In the next days about half of surgical staff, together with other surgical specialists, received detailed instruction on what to do and specific courses were held. This teams were organized and employed in different activities, in close collaboration with emergencies doctors:

- management of highly suspected patients admitted to the emergency room with mild or moderate respiratory symptoms, waiting for laboratory tests before admission or quarantine discharge;
- management of not suspected patients admitted to the emergency department;
- management of stabilized patients who no longer require intensive or sub-intensive care, but not ready to be discharged.

Courses focused on PPE, which ones are needed depending on the aerosol generating risk level and dressing/undressing procedures, on respiratory failure diagnosis and management, and on the applications of continuous positive airway pressure were held.

The organization of these teams together with the assigned wards is actually reshaped almost daily, on the basis of the occupied bed and the Emergency Department and Intensive Care Unit situation.

Together with clinical monitoring, doctors should give appropriate support to patients facing with this new condition far from their families. Moreover a medical team is available to update by phone daily the patients' relatives about health conditions. A psychological support is available for COVID-19 patients' families.

Health-care professionals distress

Possible psychological distress that health-care professionals could experience during this emergency should not be underestimated. [4,5,14,15] Many factors could lead to debilitating and disabling distress:

- extremely difficult working conditions – few resources available, the need of extra-shifts or to work in department and with staff different from the usual ones, wearing PPE during most of the shift and the scarcity of protective devices;
- the fear of getting infected and the contagious of number of colleagues;
- the inability of treat everyone (so different from our usual clinical practice) and the unpredictable course of the disease, not only in elderly patients;
- sometimes the choice to isolate oneself from family member for fear to infect them;
- the difficult familiar organizations (schools have been locked down and potential caretakers like grandparents are at a higher risk of infection).

To support health-care professionals during the current crisis, our hospital, as many other institutions, have arranged a psychosocial support that could be based also on a telephone service.

Conclusion

The collaboration spirit and the excellent coping skills that health-care professionals are demonstrating should guide every one of us during so stressful and rapidly changing period.
We need to prepare and be ready, protecting ourselves and being supported by our Institution throughout very clean and constantly updated recommendations and instructions as well as psychological and familiar support.

Even if increasingly difficult at the moment we need to cope with new situations and to innovate and learn constantly.

Let me conclude with the words that Dr. Tedros Adhanom Ghebreyesus, WHO director-general, said on March 11: “Let’s all look out for each other, because we need each other”. [2]

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