Adapting to change: How the SARS-CoV-2 outbreak changed the medical practice of a regional respiratory unit

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Dear Editor,

Assessing the SARS-CoV-2 pandemic global impact is a difficult challenge as multiple points of reference may be used: medical, social, economic, and personal, each implying specific tools and methods. Following the SARS-CoV-2 outbreak, worldwide medical systems were challenged not only by the relative and temporary lack of scientific data but also by the need to adapt existing medical structures and standards of practice[1] to a new public health situation aiming to accommodate as many patients as possible while observing the primary aim of limiting transmission. Currently, arguably effective and therapeutic protocols for SARS-CoV-2 infection have been developed and implemented. Still, there are limited quality data on optimizing organizational management for hospitals that were not created to tackle this type of cases[2-4].

We aim to provide an overview of the changes undergone by a medium-sized monodisciplinary medical unit catering for the needs of respiratory patients in the Northeast region of Romania following the administrative decision to change its practice towards SARS-CoV-2 infection to hopefully identify directions for future, more structured research. A qualitative process analysis was performed to transform a general respiratory disease hospital into a COVID-19 unit. The starting point was an academic respiratory diseases hospital with 340 beds, which included an available pneumology unit (providing a full range of services from bronchoscopy to sleep medicine), a thoracic surgery service, an intensive care unit, ambulatory facilities mainly concerned with tuberculosis patients, bacteriology and pathology laboratories, and a small radiology service. The hospital was also an academic unit allowing access and involvement to students and trainee doctors in routine medical activities.

The regional SARS-CoV-2 epidemic trend meant an ever-increasing need for intensive care and regular hospital beds; local health authorities decided to convert this hospital into a COVID-19 support unit. Such a radical change was difficult and meant implementing a new standard of practice and extensive restructuring to fulfil this new role and maintain some of the previous functionality.

We identified three axes along which the standard of practice was changed: administrative/structural, medical practice, and academic activity; for each, positive and negative aspects were identified to serve as starting points for future research on optimization. From the administrative point of view, the main change was the creation of new units – such as a clinical triage tent in the parking lot allowing for a clinical/epidemiological filtering process before admission without impinging on internal circuits and limiting the viral spread, a new laboratory structure aimed at SARS-CoV-2 molecular diagnosis or a post COVID-19 rehabilitation unit. Old compartments were modified and repurposed; some were temporarily closed (mainly those dealing with chronic respiratory diseases) to create safe circuits. The hospital consisted of separate buildings, which facilitated the creation of physically separated services aimed at COVID-19 and non-COVID-19 patients; previous local expertise with airborne transmitted diseases such as tuberculosis or influenza proved helpful[5].

Along this line, preemptively developing plans to cope with various catastrophic scenarios (not only epidemic) seem necessary as such an approach may save time and make optimum use of available resources.

Changing the medical practice meant an increased need for protective equipment that was not always readily available; this relative shortage was probably to be expected and demonstrates the need for some strategic reserve – the optimum composition and magnitude of such a provision remains to be determined.

One negative aspect of the remodeling process was

the shutdown of some medical services aimed at chronic respiratory diseases. Ambulatory services partially compensated this disfunction, but the impact of repurposing a significant proportion of available beds probably had some influence on chronic obstructive pulmonary disease, bronchiectasis, or asthma patients, in terms of quality of life and possibility of survival. Some diagnosis processes were disrupted, and severe delays were recorded in some clinical chains such as for lung cancer patients; this phenomenon was objectified by decreased numbers of new cases in the oncology departments. For other respiratory diseases impact of missed or delayed diagnosis is almost impossible to assess such as sleep apnea.

From the medical perspective, we identified three principal processes: redefining the medical circuits and timetables, getting and setting up new equipment, and redacting and implementing new medical procedures, to tackle the new disease and prevent transmission. A rota system for doctors and nurses, and support personnel consisting of three shifts with no contact teams that changed every six days was put into place. No/minimum contact practices were promoted, such as telemonitoring and tele-imaging.

This process revealed some positive aspects – more significant emphasis on limiting contact meant creating telemedicine structures and generating local protocols. These activities meant developing not only the information infrastructure but also the digital abilities of the medical and care staff.

On the negative side, telemedicine adds a complexity layer and more failure points; furthermore, inherent built-in limitations may generate medical errors with unpredictable consequences – the legislative vacuum may further complicate such a situation. Some telemedicine practice standard should probably be developed and tested to minimize errors, improve patient safety, and provide legal background[6]. Interestingly enough, some informal communication networks spontaneously emerged in/between medical teams using common messaging apps and file-sharing services; this approach proved successful, but it was discouraged as hospital policies regarding data protection could not be enforced.

The rota system also aimed to prevent personnel burnout – still, implementing strict new procedures may take a toll on physical resilience and morale. Furthermore, although effective in reducing transmission, protective equipment created problems impeding fine movements and generating physical discomfort. Developing light, comfortable, highly effective protective gear should be a priority, as similar outbreaks may be expected. As was probably to be expected[7,8], anxiety, fatigue and irritability was evident among medical personnel, some unpaid leave requests and job quitting cases were recorded; intensity and impact were not formally assessed, but psychological support was deemed practical – rigorous research is needed to identify optimal interventions.

Academic life was profoundly changed: bedside activities for medical students were temporarily suspended, trainee doctors continued their activity as a critical part in the medical team; formal medical education continued as an online process, without the possibility to work with respiratory non-COVID-19 patients, as per their curricula. A positive aspect was the development of new educational resources and teaching techniques – clinical roleplay and usage of multimedia resources gained weight in local medical teaching practices. Online activities allowed us to reach simultaneously many students with minimum effort and infrastructure. However, there are concerns regarding the level of student involvement in online educational activities. Some medical skills are not easily conveyed by online means; although e-teaching is probably going to be further developed, onsite activities should not be entirely dismissed. There are some concerns regarding the quality of residency training, which is primarily a formative type of education; involving young doctors almost exclusively with tele-imaging cases severely limits the scope of such activity, possibly more for some specialities[9]. The consequences are not easy to quantify, and concerns over medical education quality are widespread[10]. Comparative end-of-program assessments might shed some light on such long-term outcomes.

The peculiar evolution of the SARS-CoV-2 epidemic, successive waves of somewhat challenging to predict magnitude, meant the additional challenge of balancing the ratio of COVID/non-COVID services to make efficient use of available resources and maximize the medical output. To reach this goal, institutional adaptability and flexibility were paramount; strict and rigid regulations and somewhat unclear legislation increased the difficulty of this task. This may imply that local conditions and existing processes should be considered when implementing new strategies[11] and procedures[2].

In conclusion, the SARS-CoV-2 epidemic had some positive effects institution wise, it made clear the weak points and forced change; optimizing medical processes and facilities proved to be a complex task requiring medical knowledge and economic, psychological and legal expertise. The lessons we learned during the COVID-19 epidemic are essential as they lead us to question the optimum way we should approach the next challenge.

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CONFLICTS OF INTEREST
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