

Challenges in organizing a Belgian reference hospital to respond to the COVID-19 pandemic: A case report

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic resulted in an enormous influx of seriously ill patients in the hospitals worldwide. After its initial impact in Asia, Europe also suffered greatly. Caring for COVID-19 patients whilst maintaining treatment for patients with other conditions was a complex planning and management challenge. A series of interventions has been implemented to increase hospital capacity in response to the pandemic. Hospital provision interventions included the purchase of equipment, the establishment of additional hospital facilities and the redeployment of staff and other resources. Ensuring safe and high quality care to both COVID-19 patients and those with other conditions was a crucial aspect of the Belgian response in this current health crisis.

KEYWORDS

COVID-19, health crisis, hospital capacity, management, organization, reference hospital

1 | INTRODUCTION

The COVID-19 pandemic resulted in an enormous influx of seriously ill patients in the hospitals worldwide. The pandemic is unique because of its scale, the speed of its spread, the lack of data and the importance of media coverage.^{1,2}

Also in Belgium the pressure on acute hospitals, residential and primary care was disastrously high. Despite the strict measures taken by the Federal Government in the first wave from March 2020 till June 2020, the country faced a second wave COVID-19 patients in the hospitals in the autumn of 2020. The number of intensive care patients

peaked at 1474 patients on 9 November 2020 with a maximum capacity of 2000 ICU beds for COVID patients.³ These were the highest numbers since the beginning of the COVID-19 pandemic. Resulting in a second national lockdown.

AZ Delta is a superregional general hospital with 1403 hospital beds of which 64 ICU beds over four campuses and part of a network with two other hospitals, in the Flemish part of Belgium. As the third largest hospital in Belgium, our hospital was hit hard. Just like all other hospitals, AZ Delta faced many new challenges and issues associated with the outbreak. Especially in terms of bed capacity, protective equipment, staff and most important a major movement operation to a new hospital building.

2 | HOSPITAL POLICY

According to Belgian law it was mandatory for each hospital to set up an emergency plan and coordination cell. The procedures of this emergency plan required the approval of the mayor and the Minister of Health (The Royal Decree of 23 October 1964). Unlike others, the hospital's Chief Executive Officer (CEO) deliberately passed on the leadership of this coordination cell to the Chief Medical Officer (CMO). The CEO and the CMO have a solid tradition of working together as a team, together with the other members of the board of directors. It was, certainly in the beginning of the crisis, important to create a direct line from the CMO towards the physicians and from the Chief Nursing Officer (CNO) towards the nurses and other staff. In a context of uncertainty it is important to communicate directly and to stimulate interaction. They could fully focus on the operations and handling the different challenges. The CEO was present in all the crisis team meetings, so he stayed well informed, but also in the position to reflect from a "helicopter" perspective. Such a broader perspective is important to prevent tunnel vision. By empowering the CMO and the CNO the CEO chose for an explicit team approach in handling the crisis, supported by daily briefings and reflections.

3 | IN SEARCH OF CAPACITY

Like other hospitals, we were forced to act quickly, the rapid creation of additional beds and the challenges of local overflow, sometimes exceeding trained available ICU staffing and resource capacity. By order of the Federal Government a series of interventions has been implemented to increase hospital capacity in response to the pandemic. On 2 November 2020, Belgium switched over to phase 2B. This means that 60% of intensive care beds should be reserved for COVID patients. In addition, 6 times as many beds should be kept free for COVID-patients in non-intensive wards. In addition, 15% additional intensive care beds should be created. Finally, 25% additional intensive care beds should be created.

Hospital provision interventions included the purchase of equipment, the establishment of additional hospital facilities and the redeployment of staff and other resources.

We used the capability of our multicampus model to separate the flow of COVID patients from the non-COVID patients. As a result, the rehabilitation campus remained for the most part COVID-free. Additionally, all COVID patients in need of intensive care were centralised on the new main campus where the latest high-tech care facilities are available. This allowed our healthcare professionals to standardize the treatment and care of COVID-patients to the extent possible.

The other two peripheral campuses were organised in such a way to provide sufficient space for COVID patients. Throughout the hospital campuses, nursing wards became full isolation wards. In addition, there were a number of pre-cohort wards as intermediate stations for patients with unknown PCR. The nursing units that remained COVID-free were confronted with unknown pathologies and patient populations.

Together with experts in the field and academics our hospital provided extensive training and education for both physicians and nurses in collaboration with our own unique training model developed within the 'AZ Delta academy' to ensure that care is provided in the safest and highest quality way possible.

We also had to reorganise our operating theatre and recovery facilities to cope with the influx of patients. This gave us room for an extra 20 ICU required COVID beds.

This all was accompanied by the relocation of the nursing staff and physicians of other departments. Healthcare workers were pushed to their limits and are required to treat more patients at the same time. As we know from the RN4CAST study an increase in nurses' workload increases the likelihood of inpatient hospital deaths.⁴ This makes us face a serious dangerous multifactorial problem.

One of the most far-reaching interventions to free up bed capacity was the restriction of non-urgent elective surgery in March 2020. Just when we thought it could not get any worse, we were forced to completely restrict all elective surgery in the second wave (August 2020). AZ Delta was one of the few hospitals in Belgium that had to postpone oncological surgery for about a week in the heat of the moment. At that moment 216 COVID-patients were hospitalized in our hospital, with 42 critically ill patients at the intensive care unit.

These decisions were taken in close cooperation with all physicians, managers, hospital board, other involved healthcare providers in the hospital and the government. Although this model was the only feasible solution in this urgent situation. Taccone et al. 2020 rightly points out that mortality of critically ill COVID-19 patients could be influenced by organizational factors that different health care systems had to face during this first phase of the pandemic.⁵

In the meantime, plans are being made to restart the delayed care in a safe manner and to minimise collateral damage for our patients.

Fortunately, our hospital has never had a shortage of hospital beds. However, the opposite did happen. Some regions and hospitals in Belgium were confronted with a shortage of beds, including hospitals within our own hospital network. These patients were distributed among other hospitals, including AZ Delta. To ensure that the possible allocation of patients takes place in a structured manner, a distribution plan was drawn up by the Government. Hospitals that reached their capacity in terms of COVID-19 patients could transfer patients to other hospitals that still had available beds. Either the hospital arranged this itself within its own network or region, or requested a transfer from the Patient Evacuation Coordination Centre (PECC). The PECC looked at which hospitals beds were available and arranged the transfer. AZ Delta has never refused patients (COVID or non-COVID) or never transferred them to neighbouring hospitals.

There is no "magic number" to indicate when a health care system may be overwhelmed, but the numbers speak for themselves. Health system resilience can be defined as the capacity of health actors, institutions, and populations to prepare for and effectively respond to crisis, to maintain core functions when a crisis hits and informed by lessons learnt during the crisis to reorganize if conditions require it.⁶ We can always make more space, but creating the manpower to take care of our patients is the dilemma.⁷ Ensuring safe and timely care to both COVID-19 patients and those with other conditions was a crucial aspect.

4 | THE USE OF DATA AND ELECTRONIC HEALTH RECORD

The use of an integrated electronic health record offered us enormous advantages. Together with a team of IT experts, physicians and other professionals, we managed to set up teleconsultations pretty quickly in the first wave (March 2020), integrated in the electronic patient health record. Telehealth offers capabilities for remote screening, care and treatment, and assists monitoring, surveillance, detection, prevention, and mitigation of the impacts on healthcare indirectly related to COVID-19. As a result, our physicians were able to assess whether a hospital visit was necessary. This appeared to be a solution to offer contact-free continuity of care. Meanwhile, opportunities were being explored to make telehealth part of our standard care.

In addition, the electronic patient record allowed us to collect a great deal of data. On the one hand, it was very important for the crisis cell and the infection prevention team to monitor the situation in the hospital closely and to act proactively. On the other hand it gave us the opportunity to keep everyone in the hospital informed of the current situation in a transparent way. In this way, the COVID-dashboard was also kept up to date. The dashboards gave us information about the number of patients admitted at the current time, the number of patients in intensive care, the number of deaths, the new diagnosis of the previous day and the number of patients from the previous week. In addition, it was possible to check the geographical origin of the patients. At last, the government's distribution plan applied to the hospital and hospitals in the network and the bed occupancy rate were also visible. To provide real-time information, the dashboards were updated every hour. Together with infection data of the region simulation models were made to predict the bed capacity (ward and ICU) needed in the coming weeks.

It is remarkable that despite the fact that AZ Delta was severely affected, we kept our clinical activities organized and guarantee high-quality and safe care for both COVID patients, non-COVID patients and healthcare professionals. Moreover, thanks to the electronic patient record, motivated and conscientious healthcare professionals we were able to collect, analyse and process an abundance of data outside an academic setting. Resulting in national and international scientific publications.⁸⁻¹³ In this way, we tried to make our scientific contribution as a Belgian reference hospital to the worldwide fight against the virus.

5 | ENSURING THE COMMITMENT OF THE HOSPITAL STAFF

Since the beginning of 2015, the hospital went through many transitions. This started with the merger of two local hospitals. Shortly afterwards, a new merger followed (2017). Thereafter the integrated electronic patient record went live (2018).

Just before the first wave, the move to the brand new, high-tech hospital campus was planned, but for structural reasons it was postponed until spring 2020. COVID threw a spanner in the works. After thorough safety evaluation, a special COVID protocol and government approval, it was finally decided to continue the hospital movement in June 2020.

The changes in recent years have ensured that our staff can deal with transitions, but of course this also has an important downside. Among other things, this can lead to physical exhaustion and a high incidence of severe psychological burnout amongst physicians, nurses, physiotherapist and other staff.¹⁴ Moreover, we must not underestimate the impact on nursing and medical students.^{15,16}

A major bottleneck to this operational health care changes as a result of the pandemic and the major transitions was ensuring the commitment of the hospital staff.

The move and the pandemic initially had an overwhelming effect on the hospital. As a result, attention for the mental well-being of our care providers unfortunately disappeared into the background. Even though COVID confronted us more than ever with suffering and death.

Some emergency signals from nurses, physicians and others, and the results published by Vanhaecht et al. 2020 have woken us up.¹⁴ It was remarkable that healthcare professionals mainly sought support from colleagues. However, it remains crucial to also provide professional support. Therefore a crisis support team was set up. The support team is a group of psychologists with special expertise and confidants of the hospital. The team was present on the field and offered low-threshold professional support. In addition, a telephone line was opened that was available 24/7 to all staff members in the hospital. In the internal communications the importance of taking care for each other was underlined. The CEO, CMO and CNO visited the COVID-19 wards and ICUs on a regular basis, listening, encouraging and talking with staff, creating opportunities to reflect and to speak up.

6 | COMMUNITY BASED HEALTHCARE

In addition to hospitals, general practitioners' offices, residential care, pharmacies, home care nurses, midwives, family care services and other primary care organizations also faced major challenges. Therefore, as a reference hospital, AZ Delta played a pioneering role. Investments were made in triage, testing and supporting general practitioners' offices. Collaboration with the local government, other hospitals, firms and other healthcare organizations can be helpful to ensure allocation of patients with adequate supplies, materials and available trained personnel.¹⁷

For each primary care zone, a HUB-hospital was chosen with sufficient capacity for storing vaccines at -70°C to -80°C . AZ Delta was chosen as one of the 13 hospitals in the Flanders part of Belgium on the basis of capacity, possibilities for handling the vaccines and location of the hospital. The team of hospital pharmacists played a key role for the vaccination of hospital staff and distribution to the residential care and vaccination centres around the area. In addition, the hospital also played an important role in providing well-trained staff to the vaccination centres. These healthcare professionals were responsible for training volunteers and administering the vaccines to the population. Through smooth cooperation with all of the above, we were able to deal with the virus at the local level.

7 | CONCLUSION

Since the beginning of the COVID19 pandemic in March 2020, all hospitals around the world have been facing major issues and challenges. It was a challenging time in AZ Delta, but we learnt a lot as described in this case report. Investing in a team approach and partnership, with direct lines towards our physicians and our nurses for handling the crisis paid off. They are the heroes and they deserve our respect and gratitude. Listening to and supporting staff is therefore of outmost importance and so investing in their good health and resilience is needed. Flexibility of hospital capacity depends largely on the flexibility and clinical competencies of physicians and nurses. Gathering data and analysing them creates new clinical and managerial perspectives. The importance of information, internal and external communication cannot be overestimated. The crisis was an opportunity to reinforce our collaboration with external stakeholders. In doing so, we created a stimulating new spirit in our hospital, serving the community. It is necessary to invest more in stock for medication and protection equipment. Overall a more proactive approach towards crisis management in hospitals is advised.

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CONFLICT OF INTEREST

No Conflict of interest has been declared by the authors.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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REFERENCES

1. Shimizu K. nCoV, fake news, and racism. *Lancet Lond Engl.* 2020;395(10225):685-686. doi:10.1016/S0140-6736(20)30357-3
2. Zhou P, Yang X-L, Wang X-G, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature.* 2020;579(7798):270-273. doi:10.1038/s41586-020-2012-7
3. *Epistat - COVID-19 Belgian dashboard.* Accessed February 1, 2021. <https://epistat.wiv-isp.be/covid/covid-19.html>
4. Aiken LH, Sloane DM, Bruyneel L, et al. Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *Lancet.* 2014;383(9931):1824-1830. doi:10.1016/S0140-6736(13)62631-8
5. Taccone FS, Vangoethem N, Depauw R, et al. The role of organizational characteristics on the outcome of COVID-19 patients admitted to the ICU in Belgium. *Lancet Reg Health - Eur.* 2020;23:100019. doi:10.1016/j.lanepe.2020.100019
6. Kruk ME, Myers M, Varpilah ST, Dahn BT. What is a resilient health system? Lessons from Ebola. *Lancet.* 2015;385(9980):1910-1912. doi:10.1016/S0140-6736(15)60755-3
7. McCabe R, Schmit N, Christen P, et al. Adapting hospital capacity to meet changing demands during the COVID-19 pandemic. *BMC Med.* 2020;18(1):329. doi:10.1186/s12916-020-01781-w
8. Ceulemans LJ, Van Slambrouck J, De Leyn P, et al. Successful double-lung transplantation from a donor previously infected with SARS-CoV-2. *Lancet Respir Med.* 2020;9:315-318. doi:10.1016/S2213-2600(20)30524-5
9. De Smet D, De Smet K, Herroelen P, Gryspeerdt S, Martens GA. Serum 25(OH)D level on hospital admission associated with COVID-19 stage and mortality. *Am J Clin Pathol.* 2020;25. doi:10.1093/ajcp/aqaa252
10. De Smet K, De Smet D, Ryckaert T, et al. Diagnostic performance of chest CT for SARS-CoV-2 infection in individuals with or without COVID-19 symptoms. *Radiology.* 2021;298(1):E30-E37. doi:10.1148/radiol.2020202708
11. Herroelen PH, Martens GA, De Smet D, Swaerts K, Decavele A-S. Humoral immune response to SARS-CoV-2. *Am J Clin Pathol.* 2020;154(5):610-619. doi:10.1093/ajcp/aqaa140
12. Lormans P, Blot S, Amerlinck S, Devriendt Y, Dumoulin A. COVID-19 acquisition risk among ICU nursing staff with patient-driven use of aerosol-generating respiratory procedures and optimal use of personal protective equipment. *Intensive Crit Care Nurs.* 2020;4:102993. doi:10.1016/j.iccn.2020.102993
13. Vermeersch P, Cotton F, De Smet D, Martens G, Oyaert M, Cavalier E. Lessons from the Belgian experience with regulatory control during the COVID-19 pandemic for the implementation of the European IVD regulation 2017/746. *Acta Clin Belg.* 2020;1-3. doi:10.1080/17843286.2020.1787659
14. Vanhaecht K, Seys D, Bruyneel L, et al. COVID-19 is having a destructive impact on health-care workers' mental well-being. *Int J Qual Health Care.* 2020;33(mzaa158). doi:10.1093/intqhc/mzaa158
15. Ulenaers D, Grosemans J, Schrooten W, Bergs J. Clinical placement experience OF nursing students during the COVID-19 pandemic: a cross-sectional study. *Nurse Educ Today.* 2021;13:104746. doi:10.1016/j.nedt.2021.104746
16. Van Slambrouck L, Verschuere R, Seys D, Bruyneel L, Panella M, Vanhaecht K. Second victims among baccalaureate nursing students in the aftermath of a patient safety incident: an exploratory cross-sectional study. *J Prof Nurs Off J Am Assoc Coll Nurs.* 2021;37(4):765-770. doi:10.1016/j.profnurs.2021.04.010
17. Remuzzi A, Remuzzi G. COVID-19 and Italy: what next? *Lancet Lond Engl.* 2020;395(10231):1225-1228. doi:10.1016/S0140-6736(20)30627-9

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