Healthcare Management during COVID-19: Insights from an acute hospital
Lessons Learned from the Pandemic

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On 31st December 2019, Chinese Health Officials reported a cluster of 41 patients with a novel pneumonia (European Centre for Disease Prevention and Control, 2020). Six days later, the country's scientists had already determined its cause to be a new type of coronavirus which the World Health Organisation officially named SARS-CoV-2 and the disease as "COVID-19".

On March 7th, 2020, Malta reported the first case of COVID-19 in an Italian girl returning to Malta. Three days later, the government announced a travel suspension with Italy and quarantine for all returning travellers (Times of Malta, 2020). As of 7th November 2021, COVID-19 had killed more than 5 million people around the world, with more than 248 million confirmed cases across 213 different countries (WHO, 2021). An eventful two years brought many changes in almost every aspect of our lives, from the ways we interact, work, and socialise. COVID-19 has 'spread like wildfire' and presented unprecedented challenges to every single industry around the world especially healthcare (Kumar et al., 2020).

Healthcare systems have probably faced the most severe test from such a virulent and deadly illness and, as the outbreak continues to spread, this pandemic will permanently alter such systems like never before. As another wave of infections grips European and daily new cases continue to rise, the pandemic has pushed some healthcare systems to the verge of collapse with many hospitals struggling to maintain standards of care. Others have demonstrated resilience due to their capability to adopt an innovative mindset since the start of the pandemic by quickly responding with outside-the-box solutions.

Thanks to strict containment measures and early triggers of hospital surge capacity plans, Malta has successfully managed to reduce the strain on its healthcare system and accommodate the sudden increase in demand while maintaining care standards and continue to deliver high-quality patient care even during times of rapidly surging COVID-19 cases. For Mater Dei Hospital, the only general acute teaching hospital in Malta, it was a year of great transformation and immense change. The COVID-19 pandemic dramatically accelerated many changes in the hospital's ecosystem especially in the adoption of digital care options.

Surge capacity, especially in intensive care, was increased significantly. High-Efficiency Particulate Absorbing (HEPA) filters were installed in critical areas of the hospital where airborne transmission could take place. Additionally, the healthcare system has used more Personal Protection Equipment (PPEs) than we ever imagined and redefined processes at lightning speed. Mater Dei Hospital converted non-clinical areas such as the medical library, lecture and seminar rooms and staff canteen into temporary wards. The latter underwent structural changes and after three weeks of intense work, as part of

the preparedness drill, received the first patients. The hospital established an operational infection prevention and control programme to minimize the risk of transmission of healthcare-associated infection to patients, hospital staff and visitors. Amongst the different training programmes, all clinical staff were trained on the use of PPE (donning and doffing). As part of the preparedness plan, the hospital created clinical pathways outlining clear recommendations, processes and timeframes for the management of specific medical conditions or interventions, and a Rapid

Response Team to cater for logistics and management of supplies, including equipment, pharmaceuticals and consumables. The aim of this holistic plan was to significantly increase the number of ventilators, monitors, ancillary equipment, PPEs and hand-sanitising supplies. The hospital also introduced telehealth to cater for outpatient services, keeping patients and health providers safe during the pandemic without the need for them to go out of their homes.

Simultaneously, an ad hoc 'Incident Control Group (ICG)' was established to allow rapid response to newly developing COVID-19 scenarios and to establish interventions and contingency plans for each scenario. To understand and anticipate demand on the healthcare services, the team worked with real-time and reliable knowledge dashboards that analyse the COVID-19 lifecycle; how the disease is spreading, where it might spread next and how it may potentially affect the core services of the hospital. This data-driven approach enabled the team to predict potential break-even points that could induce a strain upon the hospital and identify which interventions were needed to mitigate the crisis and, more crucially, when to activate the various action plans. These dashboards gave the hospital real-time and accurate visibility of key metrics such as current bed occupancy levels broken down by general beds and critical care, activity at A&E departments as well as current waiting times.

Although the pressures from COVID-19 were particularly felt at the country's only tertiary care institution, other entities were also actively involved in the COVID-19 response. Secondary care facilities, including Gozo General Hospital and Mount Carmel Hospital, needed to establish management pathways to safely care for COVID-19 admissions. Similarly, primary care centres had to find the correct balance to identify cases that required on site assessment and care, as opposed to those who could be managed by telemedicine. Institutions for the elderly, such as St Vincent de Paul Long Term Care Facility and Karin Grech Rehabilitation Hospital, faced critical challenges, as highlighted by so many outbreaks and deaths in nursing homes in Europe and the United States. The fact that they managed to generally avoid such situations locally was testament to the policies they introduced to minimise the risk of cross transmission between residents and/or staff. Above all, COVID-19 was a massive burden on the public health authorities who not only needed to spearhead national interventions to control the pandemic but faced often unsurmountable odds in trying to undertake contact tracing and quarantine/isolation, especially when hundreds of new cases were being reported at the peak of the pandemic in March 2021.

Truly, this was a year of rapid adjustments. The comprehensive strategy and multi-dimensional approach have delivered results within a relatively short timeframe and have prepared the healthcare system to deal with the coronavirus pandemic. Vaccines are playing a critical role, but we are not out of the woods yet.

The next pandemic could truly be just around the corner, but the lessons learnt from COVID-19 will stand us well to be better prepared next time.

What does the future hold for healthcare?

The COVID-19 pandemic is accelerating some key emerging trends; and in the process shaping the future of healthcare with the objective of enhancing care quality and patient experience while reducing costs (Nogueira, 2020).

The emergence of this pandemic has prompted calls for a dramatic scaling up of healthcare Disaster Readiness Plans (DRPs). Most of the healthcare infrastructures were found not to be at the necessary level to meet the challenges of this pandemic and were short of key resources such as ventilators, oxygen concentrators as well as the workforce required to treat thousands of new COVID-19 cases per day. Governments need to establish robust plans that can prepare them for future outbreaks and make their hospitals more resilient and provide readiness for the 'future unknown.'

COVID-19 has seen a surge in acutely ill patients requiring high level hospitalization and close monitoring. Hospitals post the COVID era will need to ensure that enough ICU beds are available for patients requiring organ support such as mechanical ventilation and renal replacement therapy whilst patients who would simply need close monitoring would be cared for within conventional wards while benefitting from smart and unremitting monitoring. This format will help to improve patient safety and quality of hospital-care without dramatically increase the number of ICU beds and associated costs.

Moreover, COVID-19 has taught us the importance of infection control and the prevention of cross-infection. Hospitals post the COVID era will shift from the traditional wards to single rooms with adequate ventilation. The sourcing of personal protective equipment such as masks, gloves etc was a major challenge, especially in the beginning of the pandemic when China was closed for business. Sufficient stockpiles of these items must be retained to ensure that hospitals have the ability to rapidly switch to 'pandemic mode' and still maintain safe environments for the healthcare professionals to work in.

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The growth of improved technologies, both in terms of inter-office communication and patient treatment will bring huge benefits to the future of healthcare. Artificial Intelligence (AI) to detect diseases, such as cancer, more accurately and in their early stages will continue to augment clinicians in delivering empathetic and respectful care. Big data analytics will offer great advantages in enhanced clinical decision-support and personalised treatment. Telemedicine, on the other hand, will enable people to get immediate care from the comfort of their homes whilst the Internet of Things (IoT) will provide better patient monitoring and care. During the pandemic IoT enabled devices and applications were used to lower the possible spread of COVID-19 to others by early diagnosis, monitoring patients, and practicing defined protocols after patient recovery (Nasajpour et al., 2020).

In the fight against COVID-19, there has been many information gaps undermining international collaboration in health research at a time when the world needed it most. In a post-COVID era, there will be the need to promote more openness in access to data, to outcomes of research and to research infrastructure to enable quick visibility of outbreaks and

spread of pandemics. International collaboration in scientific research should become a normal practice in addressing global challenges.

Frontline healthcare workers along with many essential workers, have demonstrated remarkable courage, selfless sacrifice, and exemplary commitment to care for each other and every patient during the pandemic. Their resilience in caring for COVID-19 patients created many of the unforgettable images from the crisis potentially at significant cost to their own health and wellbeing. Since the start of the pandemic, numerous scientific papers have attributed increased post-traumatic stress, anxiety, depression, and burnout on the healthcare work force (Magnavita et al., 2021). COVID-19 will not be the last large-scale public health threat of the 21st century and therefore more supportive policies that ensure healthcare can meet these demands and be adequately prepared for the delivery system of tomorrow are required. More focus on programmes and measures to address the psychological risks to healthcare workers will be key in building a more resilient workforce (Lung, 2009).

The tremendous pressure on healthcare institutions over the past two years has proven to be a game-changer. Change can be challenging, but the ultimate return will be one that places healthcare systems in the optimum position to meet the challenges of the 21st century by raising the quality of care and prepare our healthcare systems to be ready for the next pandemic.

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