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One of COVID-19’s many costs: Malta’s expenditure in consumables and non-consumables, a population-based study

1. Introduction

Humanity is currently in the grip of the COVID-19 novel coronavirus which was first detected in Wuhan, China, in December 2019 [1]. The virus is now pandemic and has globally resulted in over 10 million infections and well over a half of a million deaths, with many more to come [2].

The first COVID-19 case was identified in Malta on the 7th March 2020 [3], and thus far, the country has fared relatively well with less than 700 identified cases and 9 deaths. Malta is one of the smallest countries in the world, comprising a small archipelago in the centre of the Mediterranean with a total population of almost 500,000, a land area of 316 km² and the 7th highest population density in the world. There is one large National Health Service Hospital with intensive care facilities and private hospitals [4].

By the 12th March, the country had documented nine COVID-19 cases and mandated immediate childcare, school and university closures along with all mass activities and a slew of other restrictive public health measures, a list which increased over the following weeks [4].

Government reactions varied in different countries. However, there have been a few reports with regard detailing of overall country costs for preparing for and dealing with this pandemic [5,6]. This paper will briefly outline pandemic preparedness for Malta as well as the actual process and purchases of disposables, consumables and equipment by the local health authorities (through Malta’s Health Central Procurement and Supplies Department - CPSU) in order to face the pandemic.

Costings for this exercise in risk mitigation will be estimated as a percentage of the country’s gross domestic product (GDP) and the national budget.

2. Method

A narrative step-by-step description is presented of the various measures taken by Mater Dei Hospital, which is the only state hospital within the European Country of Malta. The COVID-19 preparedness described covers both consumables and non-consumables expenses incurred by the state hospital. Data was gathered from the Central Procurement and Supplies Department (CPSU), which is the sole procurement department responsible for all health-related purchases in Malta. The Superintendent of Public Health of Malta also provided input with regards to mitigations set in place as part of the COVID-19 hospital preparations.

https://doi.org/10.1016/j.earlhumdev.2020.105260
3. Results

3.1. Preparedness

When faced with the escalating COVID-19 pandemic, some governments, such as Brazil, were in denial throughout [7]. Others, such as the Maltese authorities, initiated immediate contact with World Health Organization colleagues in the initial epicenter, China, in order to assess the scale and level of the potential public health threat [4]. This is because it was estimated that even a 20% population infection rate would have completely overwhelmed any health service (including Malta’s), even with a massive upscaling of services [8]. Malta spared no expense in preparing for COVID-19. Intensive care facilities were ramped up from 20 beds in one intensive care unit to 100 beds in five areas. Up to 600 extra COVID-19 beds for severely ill patients were also catered for, in addition to the creation of several swabbing centres [4,9].

3.2. Purchase of extra equipment and disposables

Malta was faced with an urgent demand and an immediate challenge to acquire sufficient protective wear and equipment, together with drugs, in order to safeguard the best interests of Malta’s healthcare workers and the health of the citizens of Malta. The Central Procurement and Supplies Department (CPSU) is the sole procurement department responsible for all health-related purchases. The CPSU was therefore tasked by the Government of Malta to take over the sourcing and distribution of all protective wear and equipment across the country for all Government departments. This necessitated the creation of immediate stockpiles for all of the necessary materials.

In the first two weeks during the beginning of March 2020, the CPSU performed a massive market exploration exercise to send in and confirm orders for just over €100 million for all corners of the globe (Table 1).

These items were purchased from multiple sources in order to guarantee availability. Other major items of procurement were equipment necessary to deal with patients that presented with respiratory problems (Table 2).

Sterilization equipment was also purchased to decontaminate the respective wards along with air sterilizers to purify and decontaminate room air.

Drugs purchased were not only those pertaining to COVID-19 but also for the usual functioning of the service. This is because supply chains were grossly disrupted worldwide due to internal lockdowns along with closures of country borders, stoppage of air and sea cargo movements and scarcity of supplies in general due to a reduction in manufacturing production capacity.

CPSU chartered eight cargo aircrafts, with each place loaded with over 100 tons of the above listed items. These cargos were scheduled during April and arrived at circa one week intervals. The national carrier, Air Malta supported the chartering of these planes through Qatar Airlines [4].

During this period, CPSU had to be extremely vigilant with regard to the quality of the products received. To this end, CPSU also involved colleagues at the Malta Competition and Consumer Affairs Authority in order to validate ordered items’ test certificates. CPSU also carried out independent in-house verification and laboratory testing on many of these products. Sub-standard products were discarded, and CPSU actively sought replacement/redress.

Donations were also handled by CPSU and these included not only disposables but also oxygen concentrators. The public spirit which buoyed these donations were manifest not only by the generosity of the individual donors but also from suppliers. For example, 45 of the aforementioned oxygen concentrators were purchased by two Non-Governmental Organizations, Save & Support Trust (VO/1436) and Beating Hearts Malta (VO/0887), air freight was sponsored by DHL Malta, OK Medical (the local agent) discounted them to their base cost, APCO Pay sponsored the Merchant Account and local banks (Bank of Valletta, APS, HSBC and Lombard) did not charge the public for donation transfers [10].

CPSU was also involved in sourcing service-related physical facilities, i.e. alternative clinical locations to house COVID-19 positive patients. This followed the fact that should the public health measures fail to contain the virus, the upsurge in COVID-19 cases would overwhelm the hospital, as witnessed for example in Italy [11]. Additional hospital facilities and beds were also sought so as to allow any surges to be accommodated. For this reason, beds were rented from smaller private hospitals in the country.

Furthermore, services and supplies were sourced to support the engineering changes in the expansion process which occurred over a two-month period at Mater Dei Hospital. This include the aforementioned expansion of hospital beds to accommodate up to 600 COVID-19 patients and an expansion of intensive care facilities from one 20 bedded ICU to 5 ICUs with a total capacity of 100 beds. Facilities were also sourced (private accommodation) for the isolation of healthcare workers who needed to be quarantined due to contact with COVID-19.

None of this would have been possible without wholehearted and unstinting support from the other branches of Government, especially from the Ministry of Finance and from Maltese High Commissions and Embassies abroad who helped source all of the above, as well as Air Malta, the country’s national air carrier for transport of supplies.

3.3. Percentage of GDP

Gross Domestic Product (GDP) is the monetary value of all finished goods and services made within a country during a specific period and is typically specified as per year or per quarter. The value provides an economic snapshot and changes over time and used to measure a country’s economic growth. Malta’s GDP is 14.8 billion US dollars (12.8 billion Euro) and represents 0.01% of the world economy.

The country typically spends 9.3% of GDP (2017 Eurostat data) on health, very close to the EU average of 9.9% [12]. Total government expenditure is currently €5.3 billion [13]. COVID-19 preparations cost at least €100 million, that is 1.9% of total anticipated government expenditure for 2020.

4. Discussion

4.1. Pandemic origins

Pandemics are typically zoonoses, and political and economic forces have increased the risks of these events. An example is industrial-scale
farming in China (with significant foreign investment) which has marginalized millions of smallholder farmers, forcing their shift into the market for more exotic species that were formerly eaten only for subsistence. Furthermore, industrial-scale farming in China uses prime land and forces smallholders closer to nonarable zones such as forests in proximity to bats, known reservoirs for coronaviruses [14]. For these reasons, pandemics have played out several times in the past decades with influenza repeatedly arising from poultry and pig factory farms globally [15].

4.2. Pandemic warnings

A modeling exercise for the insurance industry concluded that the annual risk of an influenza outbreak on the scale of the 1918 pandemic lies between 0.5% and 1.0% [16]. The U.S. intelligence community has almost annually reported of the devastating consequences of a viral pandemic in its worldwide threat assessment:

“Health security threats arise unpredictably from … the emergence and spread of new or reemerging microbes, the globalization of travel and the food supply…. Infectious diseases, whether naturally caused, intentionally produced, or accidentally released, are still among the foremost health security threats. A more crowded and interconnected world is increasing the opportunities for human, animal, or zoonotic diseases to emerge and spread globally…. Human and livestock population growth results in increased human and animal intermingling and hastens cross-over of diseases from one population to the other. No one can predict which pathogen will be the next to spread to humans or when or where this will occur. However, humans remain vulnerable, especially when a pathogen with the potential to cause a pandemic emerges…. If influenza or any other novel respiratory pathogen that kills or incapacitates more than 1 percent of its victims were to become easily transmissible, the outcome would be among the most disruptive events possible. Uncontrolled, such an outbreak would result in a global pandemic with suffering and death spreading globally in fewer than six months and would persist for approximately two year” [17].

The medical community has also frequently warned of the need.

“to create a preparedness plan for Disease X. Disease X is caused by Pathogen X, an infectious agent that is not currently known to cause human disease, but an aetiologic agent of a future outbreak with epidemic or pandemic potential. We have identified crucial areas for acceleration in medical countermeasure product development and international coordination. We have also reviewed novel platforms and process improvements related to manufacturing, which could revolutionize the response to the next pandemic. Finally, we created several coordination and engagement guides. These guides range from the rational design of an intervention target product profile, to the key facets of vaccine and therapeutic development, to accelerated manufacturing and regulatory mechanisms” [18].

These warnings have also been popularized by public talks, including T.E.D. Talks such as “Help Me Stop Pandemics” in 2006 by Larry Brilliant, an American epidemiologist who helped eradicate smallpox and served as a consultant for the 2011 film Contagion. He averred that a pandemic would have almost unthinkable consequences, including millions of deaths and a global economic depression [19].

Other prominent figures have also reiterated this possibility, including Bill Gates, who noted on his blog in January 2010 that “the real story isn’t how bad H1N1 [influenza] was. The real story is that we are lucky it wasn’t worse because we were almost completely unprepared for it.” Gates has publicly drawn on models developed by the Institute for Disease Modeling to warn that, at the extant state of readiness, circa thirty-three million people would die within the first six months of a global pandemic similar to the 1918 flu [20]. He called for investment in better capabilities to track and manage a deadly epidemic and indeed, the Bill & Melinda Gates Foundation has funded multiple grants and research programs geared toward developing new vaccines to prevent pandemic influenza and has invested in the Coalition for Epidemic Preparedness Innovations, an international coalition that launched at Davos in 2017. Gates even spoke in T.E.D. talks, spoke out publicly on several occasions and had even laid out a master plan to stop the next outbreak in its tracks [20].

Pandemic preparedness plans, primed by epidemiologists and virologists, were equally strident in their admonitions:

“Pandemics, whether mild, moderate, or severe, affect a large proportion of the population and require a multisectoral response over several months or even years. For this reason, countries develop plans describing their strategies for responding to a pandemic supported by operational plans at national and subnational levels. Preparing for an influenza pandemic is a continuous process of planning, exercising, revising, and translating into action national and subnational pandemic preparedness and response plans. A pandemic plan is thus a living document which is reviewed at intervals and revised if there is a change in global guidance or evidence-base, lessons learned from a pandemic, an exercise, or other relevant outbreak; or changes to national or international legislation related to communicable disease prevention and control” [21].

Indeed, documents on websites of the ECDC (European Centre for Disease Prevention), CDC (Centers for Disease Control and Prevention), and WHO (World Health Organization) are replete with similar warnings and identical content [14]. The American Center for Health Security has run several simulations. The first, called Dark Winter, was held in 2001 and simulated a smallpox terrorist attack on Oklahoma. This simulation had catastrophic projected outcomes [22]. A more recent outbreak exercise held by the Johns Hopkins Center for Health Security produced similar results by simulating a novel parainfluenza virus called Clade X, resulting in 150 million deaths [23].

In 2017, the British Medical Journal concluded that the world remains “grossly underprepared… Ebola, and more recently Zika and yellow fever, have demonstrated that we do not yet have a reliable or robust global system for preventing, detecting, and responding to disease outbreaks.” The authors urged governments “to mobilize greater resources and put in place monitoring and accountability mechanisms to ensure we are better prepared for the next pandemic…We will not be ready for the next outbreak without deeper and more comprehensive change” [24].

Even a coronavirus pandemic was predicted: “it is highly likely that future SARS- or MERS-like coronavirus outbreaks will originate from bats, and there is an increased probability that this will occur in China”, concluding that “the investigation of bat coronaviruses becomes an urgent issue for the detection of early warning signs, which in turn minimizes the impact of such future outbreaks in China…and eventually we aim to predict virus hotspots and their cross-species transmission potential” [25].

But sadly, despite being told that the world was unprepared, we still weren’t. A pandemic arose in China, spread across the world with few of the anticipated checks anticipated in pandemic preparedness plans to check viral spread both internationally and within many countries.

The local pandemic preparation ran smoothly and while a considerable number of hitches were encountered, these were dealt with swiftly and efficiently, displaying an agility and nimbleness that we were unaware of possessing.

Indeed, overall, Malta has been fortunate in that Government, advised by Public Health, reacted swiftly in order to control local spread. As Malta eases out of lockdown (along with the rest of the world), the country is prepared for more cases and even a degree of surge in the coming winter [26]. The silver lining is that these preparations and the preparedness exercise will serve in good stead in the setting of future pandemics.
Declaration of competing interest

All authors report no conflicts of interest relevant to this article.

Acknowledgments

None reported.

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