

COVID-19: A Greek Perspective

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Abstract

Greece has managed to timely and properly implement a public health safety plan and contained the burden of the coronavirus disease (COVID-19) pandemic. On the contrary, COVID-19 has led to a national catastrophe in countries with superior infrastructures, such as Italy, Spain, France, and the United States. At a time when our nation's healthcare resources were insufficient to meet this unprecedented demand, it was necessary to prioritize needs in the hopes of maximizing lives saved. Although delaying definitive treatment of disorders presented a risk to specific individuals, countless others afforded life-saving resources necessary to overcome the most threatening manifestation of this illness. The cataclysm of COVID-19 offered an opportunity to reshape health care in ways that may not have seemed possible just a few months ago. To help scientists and clinicians across disciplines connect their strengths, so that together we can advance the state of the art in medicine and lead the way to a new era of computational medicine.

KEYWORDS

cardiac surgery, coronavirus, COVID-19, Greece

1 | INTRODUCTION

The emergence of the coronavirus disease (COVID-19) pandemic in the western world during the first quarter of 2020 has resulted in a massive burden in the national healthcare systems.^{1,2} This has translated into numerous consequences affecting all aspects, namely the economy, due to the nature of the unprecedented restrictive measures that had to be implemented.^{3,4}

With regard to efficiency, Greece has managed to timely and properly implement a public health safety plan. Starting from the closure of nonessential facilities and educational institutions, followed by a strict and tightly surveilled movement restriction order, the significantly undergeared and understaffed national health system institutions managed to contain the burden of the COVID-19 pandemic. On the contrary, COVID-19 has led to a national catastrophe in countries with superior infrastructures, such as Italy, Spain, France, and the United States.^{5,6}

One aspect of this pandemic that should be eagerly stressed is the considerable delays in the treatment of serious medical illnesses

other than COVID-19, such as cardiovascular diseases, during this era, with the etiology being multifactorial.¹⁻⁶

Within 2 weeks from the detection of the first COVID-19 case, appropriately equipped hospitals were assigned to handle patients infected with COVID-19 (four hospitals in the Attica region, one in Thessaloniki region, and eight in other strategic areas around Greece). During the pandemic's peak, more hospitals were employed to handle cases of lower severity.

Concerning surgical procedures, including cardiac surgery ones, all scheduled appointments were suspended. To further eliminate the potential of COVID-19 spread in the case of emergent procedures, the patient had to be tested negative for it before any procedure was performed.

As far as private hospitals are concerned, a very strict admission protocol was implemented. Patients could be transferred to a private hospital if they had a negative test for COVID-19. Despite this initial measure, the staff (nurses, physicians, transporters) handling patients at emergency departments of private hospitals had to be appropriately geared and equipped, due to the presumed mediocre specificity and sensitivity of the COVID-19 assays. Scheduled

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surgeries were also postponed in line with the general directions provided by the health authorities.

Preliminary results highlight the significant importance of the timely implementation of predictive measures.⁷⁻⁹ Compared to countries with more modernized health systems and a higher capacity of intensive care units, Greece managed to minimize the hospital burden by halting the pandemic's progression, as demonstrated by the Center for Disease Control (CDC) data (Figures 1 and 2). On the contrary, countries like Italy, Spain, France, and the United States of America faced a public health catastrophe, with the overwhelming burden being unbearable for the health sector.¹⁰⁻¹³

As presented in Table 1, the European countries that faced the greatest consequences from COVID-19 spread significantly delayed the implementation of strict restrictive measures from the time of the first confirmed case, potentially contributing to the rapid spread of the virus in the community. In the case of the United States of America, the approach to COVID-19 containment was at the disposal of each state, with the State of New York dealing with an unprecedented healthcare burden. However, as announced cases and deaths were not always laboratory-confirmed, no safe assumptions can be made.¹⁰⁻¹³

Every country faced the COVID-19 pandemic at its best. However, no country was prepared for an event like this. In particular, in Greece, the first case was recorded 1 month after France and 3 weeks after Italy and Spain. Knowing from countries like Italy and Spain, political decisions were made for strict restrictive measures and establishment of lockdown after guidance from public health authorities (Table 1). These decisions managed to limit the spread of the disease and were crucial for the successful management of the COVID-19 pandemic.

Greece was the European country with less prevalence of infected people (4/10,000 inhabitants), but in terms of mortality due to COVID-19 (4.9%), there were 16 European countries (out of 26) that achieved mortality lower than Greece. This means that independently from the pandemic's limited diffusion, the consequences of the disease

were on the high range. Mortality by COVID-19 reflects the validity of the organization and the treatment. There are countries where the virus had the largest diffusion, but for several reasons, they had lower mortality than Greece as well (USA prevalence, 109/10,000 inhabitants, mortality, 3.87%; Chile, 182/10,000, mortality, 2.25%; Qatar, 456/10,000, mortality, 0.14%; Brazil, 97/10,000, mortality, 3.81%). Diffusion depends on how fast the politicians reacted and how effective the measures of containment were. Nevertheless, clinical results depend on the health system and how fast the medical authorities could build an organization able to isolate and treat COVID-19 patients.

The compliance of the population was tightly monitored by the responsible authorities. Taken a closer look at the geographic distribution of cases (Figure 3), the following conclusions can be drawn: (i) the movement restriction toward, namely toward the islands, led to a minimal spread in this territory, (ii) healthcare facilities of metropolitan areas (Attica, Thessaloniki, Patras, Larisa) dealt with the majority of cases, (iii) the potency of rapid spread is noted in relatively small communities (Kastoria, Argolida, Xanthi).

The success in the public health preservation aspect of the restrictive measures did not come without consequences. Regarding cardiovascular diseases, a declining trend of acute events incidence was noted in various reports, with the etiology being multifactorial. The reluctance to seek medical care with the fear of being infected and the difficulties in the accessibility of healthcare centers are potential explanations for patients with only mild symptoms during the pandemic.

In the case of cardiac surgery, the guidelines issued by the health authorities for general surgical procedures were strictly followed. That resulted in the postponement of cardiac surgeries that were considered elective and nonemergent, with potentially fatal consequences for patients with myocardial ischemia, chronic heart failure, or aortic diseases, deprived of guideline-directed optimal therapy.⁷⁻¹⁰

Total confirmed COVID-19 cases per million people

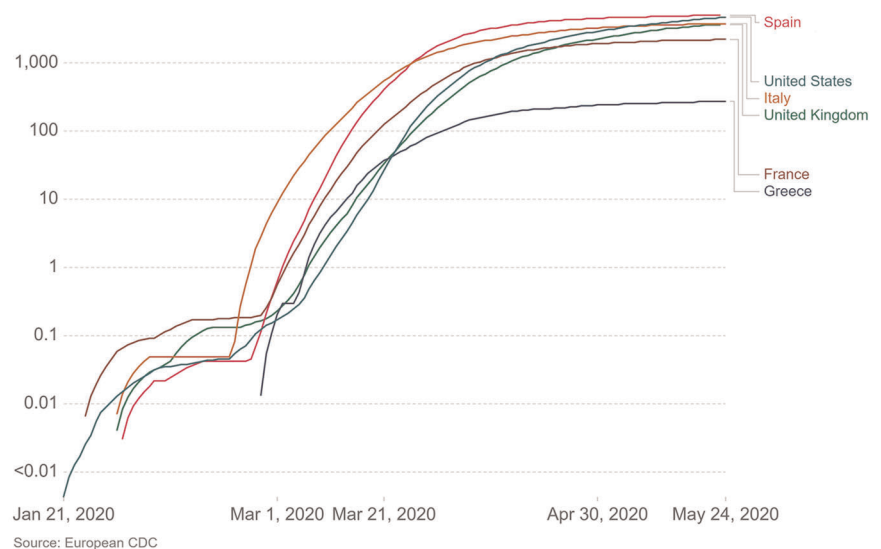


FIGURE 1 Total confirmed coronavirus disease (COVID-19) cases per million people

Total confirmed COVID-19 deaths per million people

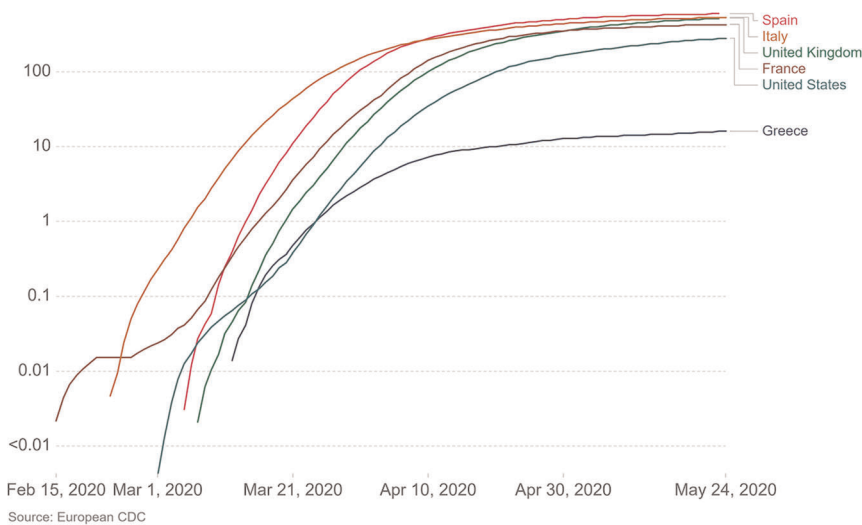


FIGURE 2 Total confirmed coronavirus disease (COVID-19) deaths per million people

The purpose of postponing or canceling cardiac operations was based upon three principles: (1) Protecting the cardiac patient: As our hospitals became increasingly populated with either suspected or confirmed COVID-19 patients, exposing the cardiac patient to the hospital environment would potentially increase their risk of hospital-acquired infection. (2) Protecting the institutions and society at large: Reducing the number of cardiac surgical procedures resulted in the preservation of valuable resources that allowed flexibility for intensive care unit beds, mechanical ventilators, circuitry for extracorporeal membrane oxygenation, pharmaceuticals, personal protective equipment, and healthcare workers with advanced skills to be used for the ever-growing numbers of COVID-19 admissions. One center (Onassis Cardiac Surgery Center) was

decided to continue its normal routine and support elective procedures. (3) Protecting the healthcare team: Cardiac surgery requires a relatively small dedicated team of uniquely skilled individuals (cardiac operating room scrub and circulators, perfusionists, cardiac anesthesiologists, and perioperative caregivers). Utilizing these individuals for potentially nonessential operations could increase their chances of COVID-19 exposure, threatening their availability for future more urgent procedures.

At a time when our nation's healthcare resources were insufficient to meet this unprecedented demand, it was necessary to prioritize needs in the hopes of maximizing lives saved. Although delaying definitive treatment of cardiovascular disorders presented a risk to specific individuals, countless others afforded life-saving resources necessary to overcome the most threatening manifestation of this illness.

For patients whose cardiac surgical procedures were being delayed and in whom alternative therapies were not deemed

TABLE 1 Cross-country variations in the timing of restrictive measures implementation

Italy	
31/1/2020	First two cases in Rome, Italy
9/3/2020	Nationwide quarantine
Spain	
31/1/2020	First case in Canary Islands, Spain
15/3/2020	Lockdown implemented
France	
24/1/2020	First case in Bordeaux, France
24/3/2020	Ban of all nonessential travel
USA	
21/1/2020	First case in Washington state
21/3/2020 to 7/4/2020	Stay-at-home order issued (45/56 states and territories)
Greece	
26/2/2020	First case in Thessaloniki, Greece
22/3/2020	Ban of all nonessential transport across the country

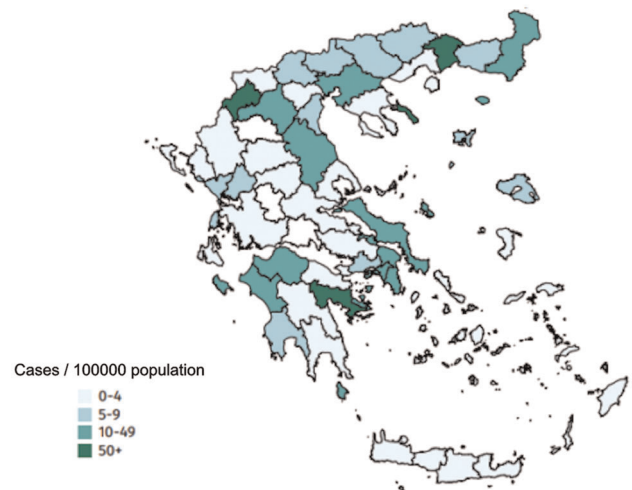


FIGURE 3 Cases in Greece/100,000 population

appropriate, programs developed an orchestrated follow-up mechanism for regular communication (1- to 2-week intervals) to monitor for progression of symptoms by tele- or video-conference. Each case was given careful consideration by weighing risks and potential therapeutic alternatives, including medical treatment, catheter-based therapy, or even a recommendation to transfer to a center with lower COVID-19 penetrance and more available resources. Under these circumstances, it was essential to acknowledge that regional competitors have now become collaborators.

The financial impact of the COVID-19 pandemic on university institutions is estimated at 790 million pounds in the United Kingdom.¹⁴ In addition, related services with accommodation, catering, and conference services related to the institutions' operation are facing huge problems. A similar situation has been reported in the United States.¹⁴ In 2017, higher education services were quite lucrative, with earnings of 44.6 billion dollars. The corresponding amount for this year is expected to be about 30 billion lower. Similar financial losses are being recorded at Australian universities.¹⁴ Universities around the world, as well as Greek universities, have adopted online teaching to meet emergencies. At the same time, they tried to secure resources for the staff's financial needs and the rest of their services. Unfortunately, the financial impact is expected to deter thousands of young people from entering a university, especially considering that more than 20 million Americans lost their jobs in April alone. Students outside the United Kingdom contribute around 6.9 billion pounds to UK universities through annual tuition. In fact, in many institutions, this income represents one-third of the total resources of the institution. As a result, the great recession that will be observed in the international student market will have frightening short- and long-term effects on education. The dynamics of the pandemic will be crucial for development until an effective vaccine is discovered. Many institutions are working on establishing a lower tuition framework that will only apply to distance learning. The problem is still the laboratories that cannot be replaced by online courses. Of course, the forthcoming changes are expected to lead to job losses and slowdown in institutions' research activities. Financial support measures are needed immediately in order for higher education institutions to survive these difficulties.

As our surgical volume declined over this critical period, the cardiothoracic surgical community in Greece maintained its commitment to the health and safety of its patients. While hospitals shift their focus to medical management of this outbreak, cardiac surgeons continued to serve as leaders, experts, and members of our medical community, willing to play any role necessary in this time of need.

CONFLICT OF INTERESTS

The author declares that there are no conflict of interests.

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