

The multiple functions of viral testing during the COVID-19 pandemic in Greece: public health and the governance of society

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Abstract. This paper addresses the role of viral testing in the management of the COVID-19 pandemic in Greece by paying attention to the ways testing advanced during the years 2020-21. Prior studies have highlighted the central role of testing in managing the pandemic and its complex implications at both local and global levels. Our analysis focuses on how testing became increasingly widespread and embedded within Greek society over time. Drawing on a range of sources, we situate public health policy-making within the temporal dynamics of the pandemic, tracing the evolving logics and uses of tests, or, as we term it, the distinct functions of testing. Our analysis foregrounds the ways in which tests decoupled from their initial clinical/diagnostic orientation to assume epidemiological, organizational, and punitive functions. In doing so, we highlight the progressive blurring between testing and screening, particularly in relation to the expansion of self-administered rapid antigen tests. We argue that this shift signals not only a transformation in pandemic management but also a broader reconfiguration of health governance toward individual responsibility and self-surveillance. We contextualize these developments within state-led initiatives promoting the digital transformation of public services in Greece. We suggest that the infrastructures and practices surrounding viral testing played a pivotal role in operationalizing this digital agenda. We conclude that the multiple functions of viral testing accumulate in overlapping layers, serving diverse purposes, often simultaneously, not limited to the strict clinical or epidemiological ones.

1 Introduction

From the onset of the COVID-19 pandemic, testing was put forward as a key public health measure. On March 16, 2020, the urge of World Health Organization (WHO) Director-General to ‘Test, test, test’ made a global impression, affecting the ways international and national public health officials designed and implemented policies to manage the pandemic (WHO, 2020). The complexity in developing testing strategies and interpreting diagnostic tests during health crises, interlinked as they are with social aspects of putting forward widespread testing and/or screening programs, has already been evident in previous cases, such as those involving sexually transmitted infections like syphilis and HIV/AIDS. The COVID-19 pandemic reinstated that testing practices move beyond the laboratory and affect many facets of social and everyday life (Stark, 2020) and brought ‘the ethics and politics of medical testing to public attention’ (Street and Kelly, 2021, p. 4). In this paper, we draw attention to the multitude of purposes served by viral testing over the course of the COVID-19 pandemic. Through a detailed case study about Greece, where the implementation of widespread testing (i.e. regular asymptomatic screening of large groups of the general population) became a core tenet of the public health policy, we trace the role of testing in the development of public health interventions from the onset of the pandemic (early 2020) until the end of 2021. By focusing on the (public health) logics associated with different uses of viral testing and uses of different tests, we argue that testing assumes multiple functions extending beyond clinical and epidemiological purposes, while these diverse functions often accumulate in overlapping layers.

Studying testing has been a key site of inquiry in history and sociology, as it is crucial in producing diagnoses and informing public health practices, affecting medical practice as well as the notions of health and illness (Jutel, 2009; Armstrong and Eborall, 2012). Tests can be appropriated or used in different ways while diverse tests can serve different functions. Medical testing in an epidemic/pandemic is of crucial importance for clinical purposes (diagnosis and treatment) and for epidemiological purposes (informing public health policies) (for the case of COVID-19, see Beaudevin *et al.*, 2020; Stark, 2020; for the case of HIV/AIDS, see Waldby, 1996, p.105). And, while testing and screening have been considered distinctive functions of tests, we similarly contend that the boundary between the two ‘is increasingly becoming blurred’ (Petersen and Pienaar, 2021, p. 13).

In the aftermath of COVID-19, a renewed scholarly interest about testing has emerged (see section 2). Already more than thirty years ago, Pinch argued to engage seriously with the sociology of testing, to view ‘testing as [a] research site in the sociology of technology’ (1993, p. 26). He claimed that ‘...the sociology of testing should not only be about the subject matter of technology, it should also be about the sorts of social and political relationships embedded within society as a whole’ (Pinch, 1993, p. 38). Recently,

Marres and Stark (2020) re-opened the discussion surrounding ‘a new sociology of testing’, significantly broadening the concept itself. They argued that ‘testing in society should be studied from the standpoint of their consequences, that is, on the basis of what tests generate’ (2020, 424). While this use of ‘testing’ with a broader scope can potentially have analytical limitations, it nonetheless prompts us to consider testing as a phenomenon no longer limited solely within the social environment and a specific domain (as in ‘field test’), but one that may involve the ‘very modification of social environments’ (Marres and Stark, 2020, p. 436).

In our effort to identify what tests ‘generate’, we document how COVID-19 public health policy in Greece was shaped by examining the official interventions concerning viral testing. We use the term viral testing (or tests) to capture a range of techniques capable of detecting viral pathogens. Furthermore, we employ it as a broader term that will permit us to extend beyond diagnostic testing (or tests) that serves the main purpose of identifying an infection or disease usually within healthcare settings. In this study, we trace the development of a testing strategy for the management of the pandemic across four phases, from early 2020 to the end of 2021. We focus on the processes through which the use of SARS-CoV-2 tests, particularly as it proliferated with the use of rapid antigen tests (rapid tests, self-tests, among other designations), became widespread beyond the confines of healthcare settings. Through this account of how testing became eventually ubiquitous, we identify four distinct functions of viral testing (of various test types).

In what follows, we begin by presenting our research framework, methods and sources. In the consequent section, we present our account of the public health policy during the COVID-19 pandemic through the lens of testing.

2 Framework/Methodology/Sources

Testing during the COVID-19 pandemic has been a complex issue shaped by a range of factors, many of which have not entirely unprecedented. Infrastructural demands, emergency conditions in overcrowded healthcare facilities, shortages of specialized personnel, disruptions in the global production and distribution of diagnostic consumables, and the need to standardize newly developed (often commercial) tests were among the prevailing challenges. During the dynamic unfolding of the pandemic, research surrounding tests and the development of novel testing technologies was also of outmost importance. Nucleic-acid-based tests (e.g. RT-PCR) were developed from early on to detect the SARS-CoV-2 virus, being considered the ‘gold standard’ (Esbin *et al.*, 2020). PCR-based tests can be labour intensive and time consuming, posing limitations to the scaling up of testing, as it was discussed during 2020. The potential (and pragmatic) use of rapid antigen tests was presented in a comparison like the

following: ‘the best test is not necessarily one that determines whether a person has any evidence of SARS-CoV-2, but one that quickly and accurately identifies individuals who are capable of transmitting the infection to others’ (Manabe *et al.*, 2020). Given the scientific debates surrounding the utility of mass testing with rapid antigen tests, the subtitle of an article in *Nature* (February 2021) read ‘Scientists still debate whether millions of cheap, fast diagnostic kits will help control the pandemic’ (Guglielmi, 2021). Thus, COVID-19 testing strategies varied considerably across countries with respect to clinical and public health uses of different tests (Mina and Andersen, 2021).

Growing scholarly research from the social sciences, including Science and Technology studies, has focused on several aspects surrounding viral testing in the COVID-19 pandemic, commonly through national case studies. For the case of France, an interdisciplinary analysis of the social appropriations of tests in the early phase of the pandemic suggested that ‘the severe limitations of testing infrastructure in France in the first half of 2020 shaped the government’s choice of lockdown strategy’ (Beaudevin *et al.*, 2020, p. 3). In the same vein, Fredriksson and Hallberg (2021) revealed how by targeting specific social groups testing showcased specific organizational and institutional features of Sweden’s National Health System. Fierlbeck *et al.* (2025) demonstrated the complexities in developing a testing strategy foregrounding a multitude of factors, notably non-science ones but institutional, organizational, social and political ones, that became apparent in their comparative analysis of the diversity of COVID-19 testing across four Canadian provinces.

The heightened role of public health uses of viral tests resulted in testing strategies that extended beyond clinical settings, often occurring without the involvement of medical personnel. This is reflected in the dynamic reconfiguration of testing strategies and the incorporation of self-testing in some countries, an issue that we study in this paper for the case of Greece. Petersen and Pienaar (2024) analysed the mass self-testing strategy implemented in Australia during the COVID-19 pandemic, emphasizing the contested role of rapid antigen tests in producing diagnostic certitude while assigning citizens responsibility for self-managing infection risk. Their analysis points to broader implications of self-testing and its subjectification effects, which we do not address here but merit further research. Nonetheless, in the context of the pandemic the decoupling of testing from clinical and epidemiological logics is aligned with a broader reconfiguration of health governance toward individual responsibility and self-surveillance.

Our focus lies on the ways the COVID-19 testing policy developed during the course of the pandemic leading to a mass testing strategy that became diffused within society, comprising of testing in health care facilities and a combination of self-testing and fee-based testing at designated sites. By examining the public health interventions and public policy, we pay attention to the processes of the gradual decoupling of viral testing from its clinical and epidemiological uses following the policy reconfigurations enabling testing to serve a multitude of purposes. In our analysis of the ways testing intersects with the

governance of society during the pandemic, we introduce the concept of 'function' in order to theorize the state-implemented measures from a socio-historical perspective. With this concept, we attempt to capture the purposes and effects that testing can have, meaning the logics associated with the testing policy. In other words, we approach the measures from the standpoint of their potential consequences (see Marres and Stark, 2020), irrespective of the explicit intentions of policymakers or legislators. In this regard, the viral testing functions are analysed as gradually accumulated, with each new layer supplementing rather than displacing the previous ones. We argue that this perspective has merits in order to better understand the role of viral testing during the pandemic governance in Greece, as well as the broader role of testing in public policy and the governance of society.

Fierbleck *et al.* (2025, p. 4) in their recently published article also refer to the functions of testing, explaining that the COVID-19 mitigation measures led to additional functions for testing, which they interchangeably refer to as 'the functions of testing policy'.¹ In their analysis, 'determining which functions testing was to perform' was part of the decision-making process. This bears a difference from our use of the term. We employ testing functions in our analysis to capture both the purposes and the consequences of testing. This permits us to account for the consequences of testing up to the degree of detailing how testing moved beyond the laboratory and healthcare facilities, surpassing clinical and epidemiological functions, and impacting several aspects of social life. Fierbleck *et al.* (2025) share similar findings in terms of the expanding functions of testing in the pandemic governance.

Nonetheless, our approach has limitations. While we are informed by approaches to medical testing claiming that the practices of testing 'have far-reaching socio-political implications, constituting regimes of governance that guide, conduct and shape subjectivities in particular ways and with particular outcomes' (Petersen and Pienaar 2021, p. 8), in this research we do not focus on the experiences of those engaging with testing practices. Along these lines, the effects of testing we refer to are circumscribed by the successive policy interventions, irrespective of instances of contestation, circumvention and tinkering. Regarding the motivation to test, recent research in medical anthropology has advanced our understanding on the ways people engage with tests as 'relational technologies'. For the COVID-19 voluntary asymptomatic testing in Scotland, Bevan *et al.* (2025, p. 289) interviewed participants in such a program and argue that 'testing obligations and responsibilities were experienced as stemming from preexisting relationships to others at multiple scales, rather than being imposed by the state'. Further research in this direction would be illuminating, for instance, by comparing obligatory with

¹ This article was published at the time we were finalizing our manuscript for submission, thus we were not aware of it. We thank Reviewer 2 for pointing it out.

voluntary testing, and possibly further discerning self-testing at home and testing at a public health site.

Our research focuses on the period from the onset of the pandemic in Greece until the end of 2021. We chose this timeframe because it includes the key policy interventions related to viral testing. Further research could extend to the period following the lifting of mandatory testing measures to analyse the public health logics that underpinned those policies. Our analysis draws on mixed sources. On the one hand, our primary material includes publicly available documentary sources. For the period under study, we collected government statements, announcements and press releases related to the deployment of testing public health policy, as well as respective laws and regulations. In addition, we examined news reporting that included interviews and statements of government officials and members of the ad hoc COVID-19 Committee. On the other hand, we draw on observational notes from public events that we attended in the aftermath of the COVID-19 emergency period in which medical professionals, biomedical researchers and public health officials reflected on their experience (2 conferences and 2 individual panels held during 2024-2025, a total of 35 speeches). In addition to the aforementioned sources, we derived insights and information from informal discussions with practitioners who were involved, in various capacities, in different aspects of COVID-19 testing across four institutions. These insights were complemented, to a lesser degree, by our own experiences as Greek citizens engaging with official testing practices during the pandemic.

In the following section, we present our findings. We distinguish four phases in the management of the COVID-19 pandemic in Greece based on the deployment of public health interventions surrounding testing, within the broader context of mitigation measures associated with successive epidemiological waves.

3 Research Findings

3.1 First phase (spring 2020): testing the specific virus

In Greece, the first recorded case of SARS-CoV-2 virus was reported on February 26, 2020. By that time, the emerging epidemic was already a growing concern, with frequent news coverage from China and various European countries. Reporting on the outbreak in neighboring Northern Italy (Gagliano *et al.*, 2020) had a significant impact on public discourse and policymaking processes. Between February 25 and March 30, the Greek government enacted five ‘Acts of Legislative Content’—extraordinary legal instruments issued by the executive under urgent and unforeseeable circumstances—at a pace of nearly one per week. These acts outlined a series of measures to restrict social activities and citizens’ movement in an effort to contain the spread of the virus (see Fig. 1, a

timeline of key events). Educational institutions, cultural venues, and a range of commercial activities were suspended. The Act of March 20 (enacted on March 23) imposed the first nationwide lockdown, initially set for two weeks but extended into early May (Act of Legislative Content, 20 March 2020). Movement outside homes was broadly prohibited, except for six specific reasons and only after notifying authorities by sending an SMS to a designated five-digit number or by carrying a printed certificate to present, if required, at police checkpoints.

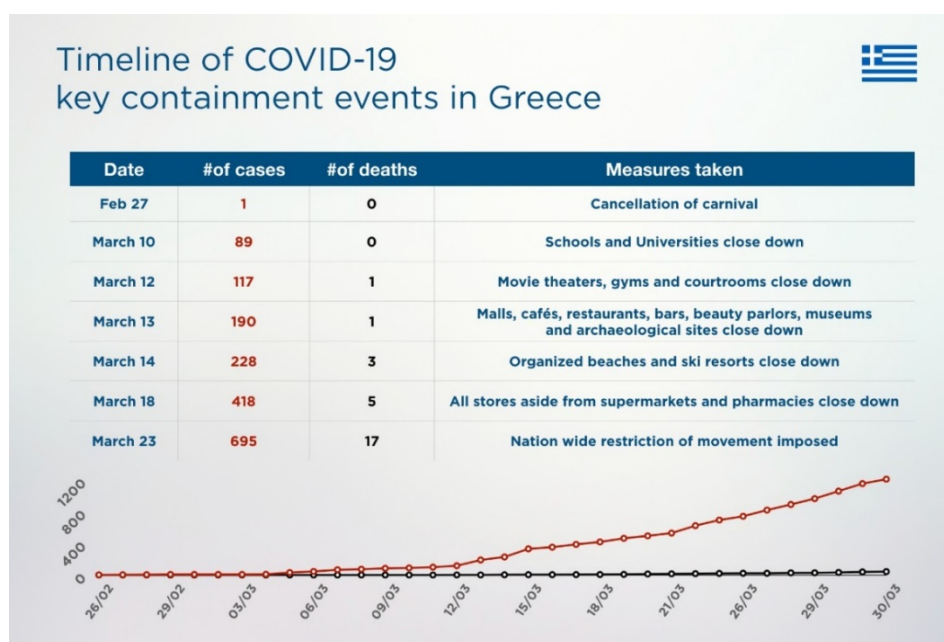


Figure 3 Timeline of key events February – March 2020. (Source: National Public Health Organization)

During this first phase, molecular (PCR-based) testing for SARS-CoV-2 was limited, largely due to infrastructural limitations, shortages of necessary consumables (such as reagents), and an insufficient specialized workforce to support widespread testing. Access to testing was primarily restricted to individuals exhibiting symptoms or those identified through contact tracing efforts. Emergency response units were established by the National Public Health Organization and Civil Protection authorities to implement various containment measures, staffed by specially assigned personnel. Contact tracing was carried out manually by these units, without the aid of digital contact tracing or warning applications. As a result, a key component of identifying ‘possible cases’ of COVID-19 involved samples’ collection conducted at individuals’ homes, targeting symptomatic persons not requiring hospitalization as well as close contacts identified through tracing of confirmed cases. Testing was, of course, also available in hospitals and other healthcare facilities for symptomatic individuals requiring medical care. Additionally, a four-digit hotline was launched to provide round-the-clock information and guidance related to COVID-19.

Access to testing was also contingent on the ability to pay, as private diagnostic centers charged high fees for SARS-CoV-2 tests (Goranitis, 2020).² Under strict lockdown measures and severe mobility restrictions, low-wage workers were largely excluded from accessing tests in the private sector. In contrast, those who could afford the cost became the ones *tested* and, consequently, reassured about their infection status. As previously noted, the overall capacity for PCR-based laboratory testing was constrained by the limited availability of essential consumables. In an attempt to meet the end of expanding testing capacity, two significant measures were introduced.

The first was the exceptional launch of a flagship research initiative titled ‘Epidemiological study of SARS-CoV-2 in Greece through extensive virus and antibody detection tests, viral genome sequencing and genetic analysis of patients, to address the SARS-CoV-2 virus’.³ This initiative, assembled on March 28, brought together a consortium of leading research units from four universities and six research centers to conduct, among others, PCR-based testing and viral genome sequencing. One of its key objectives was to meet growing diagnostic demand by developing in-house molecular testing protocols. These protocols were subsequently made available to other laboratories in the broader public sector—ranging from hospitals to research institutions (GSRT, 17.11.2020).

The second measure involved increasing testing capacities through the deployment of automated PCR analyzers, such as those typically used for routine blood screening, at the National Blood Center. In mid-April, the Prime Minister visited the Center and was photographed alongside the newly installed analyzers, stating: ‘It is very important that we can add significant testing capacity as we begin to look at gradually reopening society and the economy’ (Hellenic Republic, Prime Minister, 15.04.2020).

The lift of the lockdown was decided in early May. By the end of May 2020, the total COVID-19 cases reached 2.917 and the total number of the tests performed concerned 180.518 clinical samples (NPHO, 31.05.2020). As it is obvious, during this phase, tests served mostly clinical purposes and targeted epidemiological surveillance.

3.2 Second phase (June 2020 – January 2021): towards epidemiological screening

Following the gradual removal of restrictive measures in May 2020, the free movement of people inside the country was strongly promoted during the summer. In Greece,

² Regarding the national setting, it is important to note the lack of a uniform primary healthcare in Greece. Medical tests and examinations take place, quite extensively, in private diagnostic centers (reimbursed partly by the social security system) and not within the National Health System (see also, Vlantoni, Kandaraki and Pavli, 2017).

³ For more, see, <https://greecevs corona.gr/> (accessed: 10 June 2024).

summer continues to be a significant period for economic activity and the government attempted to implement a framework for both controlling the pandemic and securing the financial activities of the so-called 'tourist industry'. During this period, testing policies advanced to sporadic screening conducted by mobile units of the National Public Health Organization, which targeted specific high-risk settings, such as social services and elderly care facilities (NPHO, Press release, 04.06.2020).

Special measures were implemented at the country's 'entry points.' Initially, a selective screening process was introduced for passengers arriving at airports, wherein a random sample of incoming passengers was tested. Individuals who tested positive were required to quarantine for two weeks in designated, state-funded hotels (Joint Ministerial Decision, 28.06.2020). In addition, a general entry ban was imposed on foreign nationals from all countries, with the exception of those from EU and Schengen Area member states (Joint Ministerial Decision, 30.06.2020). This policy was framed as a means to control tourist inflow, while effectively keeping borders open to travelers from countries that constitute the core markets for the Greek tourism sector.

Epidemiological surveillance with the use of tests began to increase, as the rapid antigen tests became gradually available. Next to the primary functions of tests to serve clinical and epidemiological surveillance purposes, attempts were carried out to deploy screening. The testing strategy and the public health measures were reassessed following the end of the summer tourist season, as infection rates began to rise. In early November 2020, a series of regional lockdowns was introduced, followed by the implementation of a nationwide lockdown on November 7 (Joint Ministerial Decision, 6.11.2020). Although restrictive, this second lockdown was less stringent than the one imposed during the initial phase of the pandemic.

In the end of 2020, public health policy prioritized expanded testing, particularly through the use of rapid antigen tests (see Fig. 2). This prioritization is also evident in the outcomes of the flagship research initiative ('Epidemiological study of SARS-CoV-2 in Greece'), which led to the development of the 'first Greek rapid test for COVID-19' (Ministry of Development, 30.11.2020). Nonetheless, the domestically developed rapid test was not advanced toward commercial production.

In December 2020, the public health authorities, in collaboration with the Civil Protection and the Ministry of National Defense, launched a platform for epidemiological surveillance titled 'Form for Free COVID-19 Test'.⁴ Through this platform, asymptomatic individuals could register via an online form and express their interest in being tested with antigen rapid tests. Upon registration, individuals would be notified if they were selected and provided with an appointment date at an outpatient facility, typically located within a nearby military hospital. This initiative marked a significant step in shifting public health

⁴ Wayback Machine/Web Archive www.testing.gov.gr (date 30/12/2020), accessed: 10 September 2024.

policy toward widespread testing. The stated goal was to conduct epidemiological screening at the community level through 368 designated testing sites nationwide. The government actively promoted participation in the program, framing it as a critical component of the national response to the pandemic. Notably, Prime Minister Kyriakos Mitsotakis publicly endorsed the initiative via a post on the social media platform Twitter, stating: 'Random sampling to monitor asymptomatic COVID carriers is one aspect of the national strategy against coronavirus. Citizens' assistance in this great effort is of decisive importance. Register here: <http://testing.gov.gr>' (Prime Minister GR, 2020).

Simultaneously, mortality rates associated with the pandemic were rising, and concerns were raised regarding the insufficient availability of hospital beds, especially in intensive care units, and the shortage of healthcare personnel. At the end of 2020 and the beginning of 2021, the national vaccination campaign, titled 'Freedom', was launched in Greece. The campaign was swiftly endorsed by the media and actively supported by the government, with both the Prime Minister and the President of the Hellenic Republic publicly getting vaccinated (*Kathimerini*, 2020).

Beginning in January 2021, alongside the rollout of mass vaccination, testing efforts were significantly intensified through the expanded use of rapid antigen tests. Mobile units of the National Public Health Organization conducted widespread daily testing across various locations. Notably, this strategy extended beyond traditional healthcare settings, relocating viral testing practices from the confines of the laboratory into public spaces like squares.

Up to this point, we observed a shift from testing symptomatic individuals and their close contacts during the first phase of the pandemic (February to May 2020), to the gradual widespread testing of asymptomatic individuals. Beginning in the summer of 2020, testing was extended to targeted population groups, and by December 2020, it encompassed the general public. In this second phase, testing was increasingly decoupled from the confines of laboratory settings and redeployed across alternative health facilities and public spaces. This spatial reconfiguration of testing was central to the emerging function of epidemiological screening.

Total COVID-19 tests per 1,000 people

Comparisons across countries are affected by differences in testing policies and reporting methods.



Data source: Official data collated by Our World in Data (2022)

OurWorldinData.org/coronavirus | CC BY

Figure 4 COVID-19 samples tests daily per 1.000 people in Greece, September 1, 2020, to December 31, 2021 (Source: Our World in Data).

3.3 Third phase (February – August 2021): the organizational function of viral testing

The third phase of the pandemic emerged while the mass vaccination campaign was underway and the second lockdown was still in effect. Vaccination was primarily organized by age groups, even if priority was first given to healthcare and political personnel as well as patients with specific underlying health conditions. Eligibility for vaccination gradually expanded, starting with older age groups, allowing individuals to register for an appointment. Vaccination remained voluntary, with the exception of healthcare personnel, for whom it became a work requirement. This process continued over several months, and by the summer of 2021, the vaccine became available to all adults over the age of 18.

As vaccination eligibility broadened, viral testing interventions also expanded. The National Public Health Organization escalated its efforts to expand both PCR-based and rapid antigen testing infrastructures through the establishment of additional mobile units (Joint Ministerial Decision, 2.02.2021). At the same time, a significant move was the free distribution of rapid antigen tests, 'self-tests', to every citizen possessing a Social Security Number (Law 4790, 2021). The key argument for this intervention was the re-opening of the society and the economy. On the one hand, the 'Freedom' campaign

would gradually lead to a vaccinated and immune to the virus population. On the other hand, the availability of testing would give the opportunity to those awaiting for vaccination a means to act more safely. At this point, testing became a tool for promoting both the vaccination campaign and the broader justification for lifting restrictive measures of the lockdown, meaning reopening the society. In this context, testing served organizational functions for managing in novel ways both the social and economic activities amidst the pandemic crisis. The balance between PCR-based and rapid testing began to shift markedly in favor of the latter (see Table 1).

On March 19, 2021, during the official announcement of the new testing strategy, Akis Skertsos, then Minister of the State, underlined that ‘Greece, therefore, based on the new measures that we will introduce, becomes the first country to proceed, from the end of March, to the free provision of individual rapid tests to the entire population of the country. I repeat, free provision of individual rapid tests to the entire population of the country. This way we believe that we will be able to proceed in April with controlled opening of more activities.’ (NPHO, Press Release, 19.03.2021).

At the same press conference of March 2021, the Minister of the State referred to broader aspects of the public policy. He specifically referred to the general strategy for the so-called ‘digital transformation’ of public administration that the Greek state followed from the beginning of the pandemic. In the Act of Legislative Content, enacted on March 23, 2020, which imposed the first lockdown among other measures, the government included the establishment of the ‘Single Digital Gateway’ and the ‘gov.gr’ website of the Hellenic Public Administration. ‘The state acquires a unified face’ was the motto for this new service with its primary goal being the creation of a digital platform designed to gradually integrate a range of essential administrative tasks between the state and its citizens. Kyriakos Pierrakakis, the Minister of Digital Governance since 2019, emphatically declared in May 2020 that SARS-Cov-2 functioned as ‘a digital accelerator’ for the state policy (*Vouli Watch*, 2020). In March 2021, the Minister of the State elaborated on this strategy as follows: ‘[...] In the midst of the crisis, we proceeded with the rapid digitalization of the State. From March last year to this year, the digital services provided by the Greek State to citizens have more than doubled, up to 1,138. School registrations, driver's licenses, medical prescriptions, vaccination appointments and much more are now offered digitally, making our lives easier. This is the meaning of digitalization. [...]’ (NPHO, Press Release, 19.03.2021). Viral testing was also mediated by digital services, especially for the reporting of self-administered test results.

Self-tests were introduced with instructions available in videos in TV, internet and social media. The use of self-tests was promoted as an act of personal and social responsibility; the official message was ‘We frequently self-test, we take care of our safety, the health of our loved ones and the lives of our fellow human beings’(Hellenic Government, Press Release, 07/04/2021). Shortly thereafter, undertaking a self-test (still, distributed for free) and reporting the result became mandatory for participation in education activities and

for the workforce in both the public and private sectors, particularly for those required to work on-site (3 Joint Ministerial Decisions of 19.04.2021, Joint Ministerial Decisions of 7.05.2021). To report test results, a new digital platform was set up (self-testing.gov.gr), in which citizens used their tax credentials to identify (as in other services of digital governance). For the minors attending schools, the parents were responsible to report the testing results. For every positive result from a self-test, a confirmatory test was required (PCR or rapid antigen test). Designated sites for confirmatory tests were the testing sites of the National Public Health Organization (PCR or rapid antigen test) and the pharmacies (rapid antigen test).

In May 2021, a digital COVID-19 certificate was introduced for use in a variety of sites, including workplaces, higher education, and certain indoor spaces. This certificate enabled individuals to demonstrate their vaccination status, proof of recent infection, or a recent negative test result as a prerequisite for access. In July 2021, in accordance with EU guidelines aimed at restoring mobility, vaccination certificates were formally issued, and the 'Covid-Free' app was launched (Hellenic Government, 13.7.2021) to verify the health status of travellers (i.e., vaccinated, recently infected, or tested).⁵ Within this context, testing functioned as a kind of 'passport', conferring or denying access to specific spaces. The application was used by authorized personnel of entertainment venues, restaurants and cafes, any type of cultural, athletic, festive events (organized either in indoor venues, or in some cases outdoor venues) in order to scan the QR code of the certificate and to permit access to those presenting the digital certificate.

Test results became widely visible and actionable than ever before: for instance, employers in the private sector were granted access to their employees' test statuses and individuals faced penalties if they continued to work even when they had tested positive or skipped regular testing. The same applied for employees in the public sector and for personnel and students in universities (see Joint Ministerial Decisions of 19.04.2021 and of 7.05.2021). During the summer, test results became visible to a range of occasions, throughout each day.

Given the above, testing functioned as an organizational tool for regulating and disciplining key social domains, including educational institutions, workplaces, consumer environments, and the tourism industry. In addition, testing became, on the one hand, an individual obligation requiring self-testing skills, and, on the other hand, increasingly digitalized as test results were shared with and made accessible to a wide array of institutional actors. In this phase, we advocate for a substantial expansion of the functions of tests that permeates both diagnostic testing and screening.

⁵ According to Law 4816 (9.07.2021) the Covid-Free application would be compatible with the EU Digital COVID Certificate EUDCC or the equivalent certificate issued from a third country (with a QR code to be scanned for verification).

3.4 Fourth phase (September-December 2021): the punitive function of testing

By the end of summer 2021, the pandemic in Greece entered a new phase marked by the emergence and rapid spread of a new variant of SARS-CoV-2, the Delta variant. This development reignited public discourse on the appropriate public health measures to be implemented. At the same time, the vaccination campaign had reached a point where all adults were eligible to register and schedule appointments for vaccination. Public opposition began to manifest more visibly, with demonstrations and critical debates surrounding the perceived mandatory, either explicitly enforced or implicitly pressured, nature of COVID-19 vaccination policy (*Kathimerini*, 2021). In response, the government introduced targeted measures aimed at different social and age groups. For younger individuals, a policy known as the 'Freedom Pass/Data' was enacted, offering 50GB of free mobile data to those turning 18 in that year, on the condition that they had been vaccinated (Joint Ministerial Decision, 9.11.2021). For older citizens, specifically those over the age of 60, the government introduced a fine of 100 euros per month if they chose to remain unvaccinated (Law 4865, 2021).⁶

These age-specific policies reflected an effort to incentivize vaccination through both reward and penalty, signaling a shift in the state's approach from encouraging voluntary participation to enforcing compliance. By September 2021, government's discourse increasingly depicted unvaccinated individuals as having wilfully refused vaccination, given that access to COVID-19 vaccines had become broadly available to the entire adult population. This framing positioned vaccine hesitancy not as a matter of limited access or uncertainty, but as a deliberate act of non-compliance with public health imperatives. At that time, the Greek government introduced a policy mandating regular testing for COVID-19 at the expense of unvaccinated employees (NPHO, Press Release, 24.08.2021). According to the new measures, formalised in Joint Ministerial Decisions, as of September 13 those employed in the private sector and physically present at their workplace were required to undergo a test (either PCR or rapid antigen test) once per week (or twice in some cases) bearing the relevant cost (Joint Ministerial Decision, 16.10.2021). The cost of testing was set at approximately 10 euros per rapid antigen test and could be carried out at private diagnostic laboratories, clinics and pharmacies.⁷ This measure resulted in an estimated monthly cost of approximately 40 euros for unvaccinated workers, effectively adding an economic burden that functioned as an indirect form of pressure to comply with vaccination requirements.

⁶ The regulation on fines remained in effect until 2022, while two years later, in 2024, the Ministry of Health waived the fines for those who had not paid them by then (*Kathimerini*, 2024).

⁷ The cost of testing varied depending on the testing site and the type of test. The great majority of individuals would choose rapid tests to be carried out at a pharmacy that was the less costly option.

In response to widely publicized cases in which unvaccinated citizens circumvented costly mandatory testing by paying for fraudulent proof of recent infection, the type of accepted test was further specified. In early December 2021, the government mandated that the declaration of SARS-CoV-2 infection could only be made following a positive laboratory-based PCR test (Ministry of Health, 2021). Unvaccinated citizens were required to undergo testing in a private diagnostic center (unless they presented symptoms and were in need of hospitalization), at a cost approximately six times higher than that of a rapid antigen test.

Still, demonstration of proof of vaccination, of recent infection or of a negative test result was required in retail settings, healthcare facilities and social, cultural activities to permit entry indoors. For those vaccinated, access to testing (free of charge) was granted if they had symptoms or when they presented themselves voluntarily at the testing sites of the National Public Health Organization. We should note that at that point self-tests were also being sold in pharmacies. Thus, testing at home (getting tested in order to declare the result or on one's free will) gradually became a common practice (see, Table 1). In light of the Christmas festivities and the concerns arising from the emergence of the SARS-CoV-2 Omicron variant, the Ministry of Health distributed a free rapid antigen test to every adult citizen, regardless of vaccination status, during the week of 6–11 December 2021, for voluntary use toward epidemiological monitoring (Ministry of Health, 2021).

Samples Tested for SARS-CoV-2 (per mode of testing)			
<i>Testing period</i>	Laboratory tests (RT-PCR)	Rapid Ag (by NPHO in designated sites)	Declared self-tests (Rapid Ag)
1/1/2020 - 31/12/2020	2.803.026	579.462	-
1/1/2020 - 31/03/2021	4.171.213	2.364.533	-
1/1/2020 - 30/09/2021	6.632.532	13.506.241	38.972.750
1/1/2020 - 31/12/2021	8.282.716	38.966.229	66.949.593

Table 1.: The table presents the samples tested, according to the designated Daily reports of the National Public Health Organization (NPHO, Daily report, 31/12/2020, 31/03/2021, 30/09/2021 and 31/12/2021).

During this phase, the functions of testing multiplied serving additional purposes. The requirement for regular testing of unvaccinated workers was not merely a way to incentivize vaccination but it assumed a punitive function for those who had been labeled 'unvaccinated'. It targeted specific groups—primarily low-waged workers—by imposing

them a further financial burden: individuals were compelled either to comply with vaccination mandates or to bear the recurring cost of mandatory testing, thereby quite literally paying for their choices.

In December 2021, the government launched the digital application ‘Gov.gr Wallet,’ which enabled users to store and present COVID-19 vaccination and testing certificates (TA NEA, 2021). The innovative aspect of this initiative was the rapid integration of the national identity card into the same application, establishing it as an official tool for digital identification. Over time, the application was progressively expanded to include additional state-issued documents, such as driver’s licenses. At present, the Gov.gr Wallet serves as an official platform hosting a broad array of personal identification documents. Notably, one of its more recent applications includes the purchase of football match tickets, a function introduced in response to new legislation aimed at strengthening personal identification and enhancing security protocols at sporting events.

4 Discussion – Layers of testing

This paper showcased the functions of viral testing within the public health policies implemented during the COVID-19 pandemic in Greece. We introduced the concept of functions to interpret the testing interventions from the standpoint of their potential consequences in society as a whole. The four distinct functions of various types of tests accumulated progressively over time in overlapping layers, with each new layer supplementing rather than displacing the previous ones. Our aim was to reveal the processes through which testing has become a ubiquitous feature of everyday life. Further research is needed for assessing the value of this approach for different societal groups.⁸

The first function appeared at the outset of the pandemic (and is in place to this day). It was oriented toward clinical diagnosis and targeted individuals presenting symptoms, with the aim of confirming infection and guiding clinical intervention. We refer to this function as *testing the specific virus*, a function rooted in biomedical logic and healthcare provision.

As the virus spread, a second function gradually took shape. Initially introduced sporadically during the summer of 2020, it became more institutionalized by December

⁸ *It is important to note that during the pandemic, there were always people that were targeted or excluded, directly or indirectly, by the public policies; in this paper our research does not expand to cover this issue. For marginalized populations—such as undocumented migrants, whether residing in camps or in urban settings, and homeless people—access to testing and screening policies varied. Many among these groups lacked a Social Security Number or access to the digital platform gov.gr, both of which were prerequisites for participation in testing. Further research is needed that can focus on the potentially discriminatory character of the emergency measures (for instance, targeted screening programs).*

of that year. This function focused on *testing for epidemiological screening*, expanding from group-based epidemiological surveillance to population-level screening, shifting the focus away from individual diagnosis.

With the launch of the mass vaccination campaign, viral testing acquired additional functions, signaling further purposes as Pinch (1993) might have pointed out. Gradually, a blurring occurred between diagnostic testing and epidemiological screening. This blurring, we argue, indicates that testing functioned in new social areas as an *organizational tool*, beyond its initial biomedical and/or epidemiological logics. The mass use of self-tests was promoted both as a way to self-diagnose and self-manage one's health, and as an invaluable contribution to epidemiological screening. In this expanded capacity, testing also functioned as an apparatus of coordination and control within workplaces, educational institutions, hospitals, and other public settings. Within the context of the government's 'Freedom' campaign for COVID-19 vaccination, testing became part of a broader disciplinary mechanism aimed at regulating mobility, individual behavior, civic responsibility and social relations. In this sense, it served as an infrastructural intermediary that helped sustain institutional operations and social relations under pandemic conditions by reordering them.

However, contestation quickly emerged. During the fourth phase, we argue that testing assumed a *punitive* function, particularly in relation to unvaccinated individuals. No longer serving primarily clinical or epidemiological purposes, mandatory testing was repurposed as a tool of sanction. As such, it functioned not to persuade or protect, but to punish, both symbolically and materially, those who refused vaccination.

At this point, it is important to foreground an underlying and persistent dimension that remained present throughout the entire period under study. This is what the government called 'digital transformation of public administration,' a policy objective that had already been decided before the pandemic emerged. The pandemic functioned as an 'opportunity' for the Greek government to pursue this transition, while the emergency measures (lockdown, testing, vaccination) were also implemented through this infrastructural change. Computing integration into public infrastructures signified a shift in health policy or, as Agar (2003) probably would argue, a re-appearance of the state in social life in spaces where previously it was absent.

Considering the above, the dynamic configuration of the mass testing strategy, exemplified in the widespread use of self-tests and rapid antigen tests at designated sites, enabled the embedding of testing within public spaces, domestic settings, and everyday life. Beyond the blurring of boundaries between diagnostic testing and epidemiological screening, the organizational and punitive functions rendered widespread testing a prerequisite for governance. Further research could explore whether such processes of diffusing testing into society encompass an educational function, that of cultivating a culture of testing. Self-tests form part of a wider shift toward

the self-management of health and the reinforcement of individual responsibility, aligned with deeper political objectives. The pandemic provided an opportunity to observe the shifting priorities favoring private profit over collective welfare, as reflected in the government's reluctance to provide substantial support for healthcare personnel and to invest in the public health system's infrastructures.

Viral testing as implemented within public health policies during the pandemic in Greece exhibited flexibility, accommodating diverse purposes, objectives, and strategies rather than functioning solely as clinical or epidemiological intervention. Our analysis of the four overlapping functions of viral testing, from diagnostic and epidemiological to organizational and punitive, demonstrates how it simultaneously advanced strategies decided long ago, such as digital integration, and responded to emerging challenges, including contestation and vaccine refusal. By taking testing as our unit of analysis, we argue for its significance as a critical site for investigating broader social processes and the governance of everyday life in contemporary society.

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