



# Health state: time for treatment

*One could call it a Herculean labor. It would not be an exaggeration.*

*Among the priorities set in the National Recovery and Resilience Plan, component 3.3 is titled “Improve resilience, accessibility and sustainability of healthcare”*

by Symela Touchtidou

Reforms in selected areas of the healthcare system will seek to provide “equal access to high-quality health services, increased efficiency in services’ provision, digital transformation of health services and financial sustainability of the healthcare system”.

The “digital transformation of health services” will bring e-Health in Greece, by introducing reforms like the “Digital Patients’ Health Records, Cancer treatment/e-health program, Telemedicine, Hospital Logistics”.

Like we said, a Herculean labor.

### Bad reputation

In Greece, the healthcare system has been stigmatized by corruption, mismanagement and waste of public funds. When the country entered the decade-long debt crisis and the three Adjustment Programs, healthcare was among the first on the radar of budget cuts.

Total per capita health expenditure in Greece stood at €1,327 in 2018, compared to €2,027 in 2009. Between 2009 and 2018, public health expenditure per capita in Greece fell by 43.9% to €779.

Total expenditure (public and private)

for healthcare has fallen to 7.7% of GDP (2018) compared to 9.9%, the EU average. Public expenditure has fallen to 4.5% of GDP compared to the EU average of 7.9%.

In the Euro Health Consumer Index (EHCI), the index assessing the performance of national healthcare systems on 46 indicators, among 35 countries, Greece ranks on the 29th place.

### Saved by a pandemic

The Covid-19 pandemic crisis changed the way public opinion views the healthcare system. Doctors and nurses are now heroes, hospitals are consid-

## Greek economy

ered a refuge. There is no better time to open the discussion for a new, modern and more effective system.

“The digitalization of health services is expected to be one of the most important factors in the transformation of the health sector in the coming years,” notes the study “Healthcare 4.0 – Digital Transformation of the Healthcare Sector, which was developed by Deloitte for the Digital Transformation Observatory of the Hellenic Federation of Enterprises (SEV).

“The industry will be shaped by the needs and expectations of this new ‘consumer of health services’, who expects upgraded experiences, with key features being personalization, comfort, speed, and immediacy of service delivery. Towards this end, two major changes are to be expected:

- First, changes in the setting of healthcare, which will be gradually transferred from the hospital to the patient’s premises.
- Second, changes in the way healthcare is provided, that is, increased emphasis on prevention and ‘cure’ of the

disease before it occurs,” the study concludes.

The “Pissarides Committee” (the Committee that took up the task to provide a roadmap for the development of the Greek economy, headed by Nobel recipient in Economics Christopher Pissarides) proposed specific tools to achieve digital transformation:

- Electronic Personal Health Records (ePHRs)
- Smart health and smart hospitals
- Telemedicine
- Expansion of the electronic prescription system in hospitals
- Upgrading the digital systems of hospitals and other health units/ information exchange between all health care providers
- E-procurement system for hospitals
- Mega data and Real-World Evidence Data

“It is unconceivable for a developed country not to use Electronic Personal Health Records (ePHRs),” Yannis Tountas, professor of Social & Preventive Medicine in the Medical School of



Y. Tountas: “We need to set the wheels in motion”

the Athens University told GBF. “This should be the starting point. In Greece, we have been trying for years to introduce the ePHRs, without success. There are scattered ePHR programs that some private doctors and clinics use. But this is not working. There should be a harmonization of all these different programs.” Introducing such a vital reform will face a major challenge: surpassing the infamous Greek bureaucracy.

“The authority responsible for such a programme is obviously the Ministry of Health. There are many institutions, though, that might be involved: IDIKA



### Papageorgiou General Hospital: Greece’s first smart hospital



In Thessaloniki, the Papageorgiou General Hospital that runs under a public-private partnership scheme, is the first that introduced smart hospital technologies in Greece. Not to a full extent, but it is a start.

“Modern technology, through the use of automation, telecommunications and information systems, ensures security, autonomy, adaptability and high efficiency,” Michalis Karaviotis, the hospital’s President told Greek Business File. “The Papageorgiou General Hospital has realized that there are almost unlimited possibilities when its resources are interconnected and interact. Thus, with the use of Communication and Information technologies, the ‘Papageorgiou’ aspires to improve the quality of patient care, the cost of services, and the security and privacy of patients, and to deal with possible shortages of staff and space.”

#### 3D printing of human organs

Papageorgiou uses personalized, 3D-printed liver models for preoperative planning before liver hepatectomy sur-

gery. This way it minimizes blood loss and ensures smoother and faster recovery. The next step –already in a pilot phase– is to convert the 3D instrument into an augmented model (in the form of hologram), displayed during surgery to help perform a safe anatomical hepatectomy.

#### Social robots

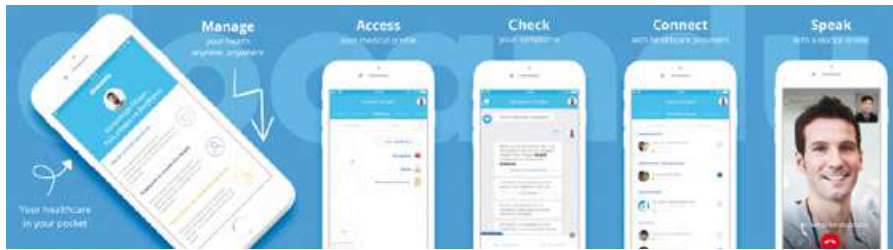
The hospital uses social robots specially designed to help children on the autism spectrum or children that face learning disabilities.

#### Safe blood transfusions

The hospital’s IT Department has developed the Safe-blood application. It uses mHealth technologies to ensure that every unit of blood coming out of the Blood Bank Department will be given to the right patient, completely eliminating the risk of human error.

#### Bedside terminals

For a few years now, Papageorgiou has installed bedside terminals for 165 of the 780 available beds. The terminals function as entertainment, information and support units for patients and their companions. Most importantly, the “smart” terminals bring the whole hospital to the point of care, providing direct touchscreen access to the hospital’s information system and the medical records of the patients.



(i.e., the e-Government Center for Social Security Services), EOPYY (Greek acronym for the National Organization for the Provision of Health Services), EOF (i.e., the National Organizations for Medicines) and NPHO (the National Public Health Organization). Each of these institutions has its own organizational structure and operating mechanisms, instead of using a common framework. This is why we had the mess up with the exact number of new Covid-19 cases. (Y. Tountas refers to the political dispute provoked by newspapers' reports that there was a parallel "double" recording of the new Covid-19 cases by NPHO that misled the experts' committee that proposes measures against the pandemic.) Y. Tountas is a man of action. He has two projects in the pipeline that will bring a

slice of the Greek healthcare system in the digitalization era.

Being in charge of Athens city medical centers, he proposed a home care system for older patients with chronic conditions. "The program will be financed by European funds," he tells GBF. "Once it manages to surpass the bureaucratic impediments, the home care system will revolutionize the way patients with chronic diseases are treated. The program will provide elderly patients with equipment that will make it possible for them to communicate with the municipal medical center. Their vital signs will be measured, and their condition will be monitored in a steady basis. A team of experts, doctors, dieticians, psychologists will provide them with guidance and advice."

Furthermore, in early 2021, one of Greece's insurance funds will introduce a platform for telemedicine.

This is not the typical Greek telemedicine of remote islands connecting with city hospitals. It will be a platform available to citizens all over the country.

"The user will give his medical profile answering a thorough questionnaire (about their medical conditions, habits, smoking, nutrition etc.)," Tountas explains. "The data will be processed, and the user will receive a detailed evaluation on his state of health. He will also receive medical advice and suggestions for clinical exams and/or vaccination, along with a reminder alert for the exams' dates. None of these systems is something new. They are broadly used abroad. We will not reinvent the wheel. We will just set the wheels in motion in our country," Tountas told GBF.

### An engine of growth

Although it is not possible to put a price tag on the cost of such a massive project, people familiar with the matter told GBF that money will not be an issue.

### Electronic medical records (EMR)

More than a decade ago, the Papageorgiou Hospital introduced the use of Electronic medical records (EMR), i.e., a complete, digital record with clinical and patient information, laboratory tests and findings, as well as images from the Radiodiagnostic Laboratory. The EMR can be easily accessed from any part of the hospital via desktops, laptops and tablets enabling easy and immediate decision-making, saving resources.

### Free wireless network access

Papageorgiou has an extensive Wi-Fi network, through which free high-speed access is provided to all its premises.

### Real-time view at the Emergency Department

The IT team of Papageorgiou has developed a website ([www.gnpap-golive.gr](http://www.gnpap-golive.gr)) and an application (GoLive application-Papageorgiou Hospital) that give real-time information on the waiting times for each specialty in the Emergency Department.

### Telemedicine center

Papageorgiou will offer telemedicine services to patients living in remote areas starting with the municipalities of Chalkidona and Lagada in the Thessaloniki region. The three telemedicine stations of the hospital and the two stations of the municipalities will be interconnected with the National Telemedicine Network (EDIT).

This way, they will be completely operationally autonomous and be able to interact with the 43 points of EDIT.

### A paperless hospital

Papageorgiou is perhaps the only hospital in Greece that does not use paper documents. Part of its operations has been moved to the hospital's intranet platform.

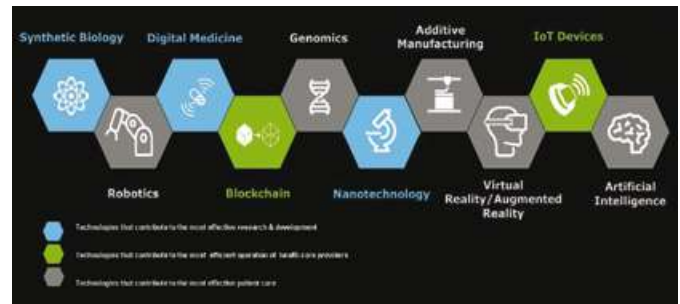
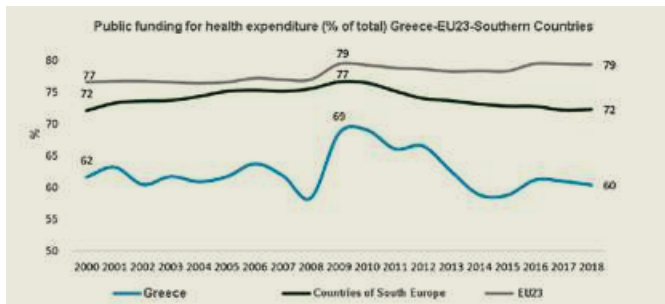
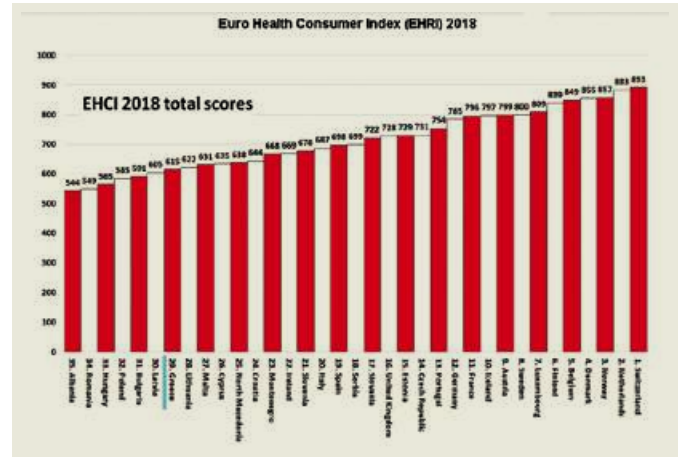
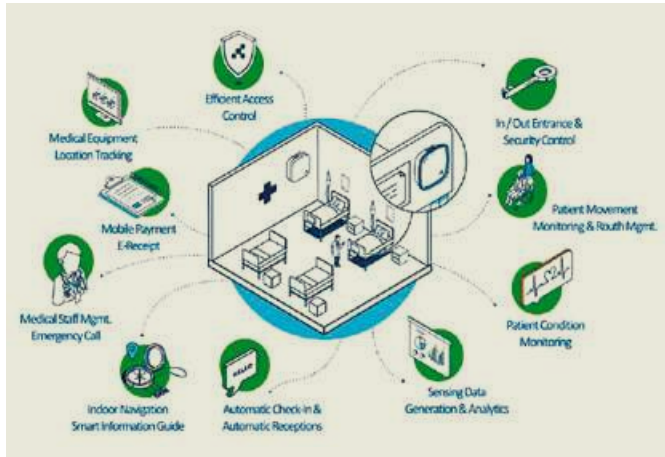
Other administrative and medical documents are automated and digitized by a system platform (Saperion). The hospital uses digital signatures to save time, resources and protect the environment.

### Location services

Finally, a Location-based service (LBS) is used for all important assets of the hospital. The LBS is based on Radio Frequency Identification-RFID (RFID) technology, which allows real-time monitoring of the assets, with an one-meter accuracy.



Michalis Karaviotis, President of Papageorgiou General Hospital



“The funds from the European Union will be enough,” they believe.

The challenge for the Greek state is to prioritize the needs, secure transparent public procurement and maximum use of the funds. To make all the above happen, the participation of the private sector is essential. The Internet of Things (IoT), apps, platforms, blockchains, all the necessary technology will come from innovative companies. In Greece, many have already emerged, offering their services to the private healthcare system.

**Docandu: Easy, affordable and accessible services for all**

A Greek living abroad, Dr Petros Pandis wanted to create an application for those who travel or live abroad and want to keep in touch with their personal doctor “back home” or share their medical history. The pediatric surgeon Dr Ioannis Georgopoulos –working in the NHS of Greece– had identified the added value that a modern digital medical service could bring to the system.

Their exchange of ideas created a “smart” tech health startup, Docandu.

Docandu is like “a personal healthcare assistant”. It gives the user instant medical advice for their symptoms through

AI technology, as well as guidance for the next steps. It simplifies the patient-doctor interaction, by connecting the user to either a Docandu GP or by offering a wider selection of private doctors (marketplace). Finally, it offers a convenient virtual space for medical records storage with easy access and sharing capabilities. Its main features are:

- Online medical profile – all the user’s medical records in one place
- Online medical consultation
- Symptom Checker, the answer to “Googling” for medical inquiries

■ Diabet – support patients with diabetes

■ COVID Checker, a mobile & web solution to identify coronavirus symptoms, associated risk, to provide reliable guidance, and to connect patients in need with a doctor. In collaboration with the Medical Association of Athens and the Region of Attica, COVID Checker is offered for free. This innovation has helped more than 40,000 citizens so far and helped decongest the public healthcare system. More than 56% of its users were 40+ years old.



Docandu has been awarded for its key innovative solutions against the Covid-19 pandemic by the Ministries of Digital Governance, Health, and Development and Investments (GreeceVsVirus).

“The recent medical crisis worked as a facilitator that unveiled the hard-to-innovate old-fashioned structure of the Greek public healthcare system,” Pantis told Greek Business File. “At the same time, it pushed forward some radical technologic changes. In particular, the primary care reform aims at encouraging self-care, telemedicine, home care and the adoption of a national digital medical records system. This reform can come with public-private partnerships but also with the encouragement of startups. Docandu is ready to play an important role in this transformation, as it is a fully digital healthcare solution, with an established position via collaborations with private and government organizations and academic institutions. Docandu can provide an easy, user-friendly application that will allow citizens to make the most of the country’s health services, including the personal electronic health record from IDIKA. Last but not least, Docandu solutions are affordable, supporting the democratization of healthcare.”

Docandu has raised \$200K from angel investors and crowd funding.

### BookingClinic: Connecting patients with doctors and clinics

In 2020, the European Institute of Innovation and Technology (EIT) expanded the scope of Head Start funding to assist in the immediate need for solutions to combat Covid-19. It has selected 21 startups that will develop products and services to help Europe contain, treat and manage the disease.



ROY

## Skevos Zervos: The Father of Telemedicine

An iconic figure of the global medical community, doctor Skevos Zervos, Professor at the School of Medicine at the University of Athens (born in the Greek island of Kalymnos in 1875), is considered one of the pioneers of telemedicine.

In the 1930s, he developed a marine telemedicine system. Using radio station with microphones, dynamic speaker, headphones and special recording device, Professor Zervos performed broadcasting of auscultation of lungs and pulse.

In 1946–1956, the new technology was demonstrated repeatedly at the meetings of the Athens Medical Society and other scientific events.

Professor Zervos affirmed that he could “broadcast auscultation of lungs and heart rate to any point of land and sea, without any doubt, absolutely distinctly. This special tele-examination is of utmost importance for humanity” (Autobiography of Skevos Zervos, 2003). He proposed to use the system of “tele-examination” on marine vessels, cruising across the Atlantic Ocean from Piraeus to New York, and also to hold teleconsultations between Athens and Paris. However, according to Professor Zervos himself, because of “heartlessness and criminality... of the state science” at that time, the project was not put into action.

Source: “A Century of Telemedicine: Curatio Sine Distantia et Tempora”, A. Vladzmyrskyy, M. Jordanova, Fr. Lievens, Bulgaria, 2016



Professor Skevos Zervos is performing “tele-examination” by means of radio connection (Athens, Greece, 1936)

Among the 21 startups, there is one Greek: BookingClinic.

BookingClinic.com is an online tool to search for doctors, treatments and clinics, to virtually meet a doctor (via video call), to receive trustworthy medical consultation, compare different treatments and clinics, and, lastly, to book a treatment with the doctor of the user’s choice at the best price.

Patients have online access to transparent info and data on medical experience, hospitality info, customer satisfaction ratings and total costs. Its network includes clinics in several countries, with more than 200 doctors and 400 treatments of 16 medical specialties. During the first lockdown in Greece, BookingClinic offered its services for free taking on board the humanitarian organization “Médecins Du Monde – Doctors of the World, Greece” to offer free online medical consultation for Covid-19.

Moreover, BookingClinic cooperated with the humanitarian organizations ActionAid Hellas and IASIS to offer online psychosocial consultation related to Covid-19.

This initiative has now expanded and “Médecins Du Monde” offer medical consultation via video, not only for Covid-19 but also for various medical problems of ten different medical specialties.

“The pandemic rewrites the future of healthcare and enhances digital changes as people rely more and more on e-services,” Vasileia Chatzistergiou, medical data & communication manager of BookingClinic told GBF. “Our vision is to establish a digital-consultation ecosystem, with humanitarian organizations and private clinics, and to connect patients to health providers promoting transparency and trust. Not only during the pandemic, but in the future as well, we believe that e-health services are here to revolutionize our past habits.”

The team of BookingClinic has been awarded by the Envolv Entrepreneurship Award GR 2018 (Libra Group – The Hellenic Initiative) and has also been selected among the 100 most innovative startups invited to participate in the TIF Helexpo 2018 and 2019 by the Ministry of Digital Policy, Telecommunications and Media.

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